

Chapter 3

Competitive markets and efficiency

3.1 Economic efficiency and competitive markets

This chapter considers the role of markets in achieving economically efficient outcomes. Both the strengths and the weaknesses of the market system will be considered. Over time, most economies around the world have gravitated towards using the market system for allocating resources as it is seen to be the most efficient way to do so. Using the market alone, however, can result in an **inefficient allocation of resources**. This occurs when the combination of goods and services that is produced does not achieve the highest level of collective satisfaction – which economists refer to as **'market failure'**. The sources of market failures that will be discussed in this chapter do not necessarily advocate the removal of the price mechanism or excessive intervention in the market, but they do highlight the need for some modification to the way markets work to achieve more desirable, welfare promoting outcomes. In the final section of this chapter, the problem of government intervention in the market that worsens, rather than increasing, efficiency will also be considered.



Features of competitive markets

Before we consider the impact of competitive markets on efficiency, it is important to recall the key features of competitive markets. As discussed in Chapter 2, the market structure that forms the basis of demand and supply analysis is called **perfect competition**, sometimes also referred to as a 'perfect market' or a 'perfectly competitive market' or even 'a competitive market'. Some key conditions required for such a market have been reproduced in Table 3.1 below.

Key feature	Explanation
A large number of buyers and sellers	This means that each economic agent acts independently in the market. No individual buyer or seller therefore has the market power to influence the price. This leads to the condition of price taking rather than price making.
Homogenous products	It is assumed that the products being sold are virtually identical and easily substitutable. This encourages the suppliers to offer the products at the lowest price possible because this is the main way to attract customers (rather than, for example, being a better brand).
Ease of exit from and entry into the market	There are low set up costs in the industry which means that if profit making opportunities exist (for example, because the good or service has increased in popularity), then new entrants can seek to capture a share of the market, possibly by undercutting the existing suppliers who may be making very high profits in the short term (referred to in economics as 'abnormal profits'.)

There are also a number of other assumptions about the features of a competitive market:

- Buyers and sellers operate with **full information**. They are aware of what they are buying and selling and are able to easily compare prices. Based on this information, they make fully informed **rational choices**.
- The economy's **resources are mobile** and will be reallocated towards those areas of production that generate the greatest benefit.
- Both the buyer and the seller seek to maximise their own wellbeing. For the seller this is likely to be their **profit** and for the purchaser they are seeking to gain the most satisfaction they can (often referred to in economics as their **'utility'**).

How competitive markets affect allocative efficiency

Allocative efficiency, as defined in Chapter 1, is the combination of the goods and services (produced and consumed), which achieves the highest level of collective satisfaction for a society. Inherent in this definition is the belief or idea that the *right* goods and services are produced, in the *right* way and those products are then distributed, via the market, to those who value them the most. While the definition could be contested on a number of grounds, it will be one of the criteria used to determine whether the market system is efficient.

As explained in Chapter 2 and recapped above, the market system is assumed to operate in a competitive fashion. The large number of independent buyers and sellers who are operating and acting independently, selling homogenous products with low set up costs (no barriers to entry) and low levels of government regulation means that it is easy for new suppliers to enter the market should profit making opportunities arise. It is also easy for firms to leave if they find the product they are selling is no longer profitable (or as profitable relative to other areas of production). This is linked to the assumption that resources are mobile and can be easily reallocated to an alternative area of production.

The competitive environment is said to promote allocative efficiency because suppliers pay close attention to price signals and act in their own self-interest. They will look to meet the needs and wants of the consumers. It is the buying decisions of the consumers that ultimately determine how resources are allocated in the market. If there is an increase in demand for green smoothies, for example, then the market is the most effective way to ensure that this change in needs and wants is addressed. The increase in demand will lead to a shortage in the short term, and those consumers who have a greater willingness and ability to purchase above the current price, will bid up the price for the now-scarce smoothie. Profit making institutions will respond to the price signal and reallocate resources, such that they are now selling more of the products with a higher relative price (especially when that higher relative price has been driven by changes in demand). The key point here is that, in altering their production activities, the allocation of resources has become more efficient because the change in the types of goods and services being produced once again reflects the desires of the population.



Consider what would happen if the market did not work. If the same volume of smoothies were supplied to the market despite the increase in demand, there would be some consumers who would miss out on their desired product. There would effectively be an underproduction of smoothies in the market relative to the level of demand. The suppliers in the market will therefore generally be responsive to the demands of their consumers because to sell anything that is not in demand will result in stockpiles and ultimately result in the demise of those businesses. A lack of responsiveness to the increase in demand is more likely to happen in a market that is less competitive, such as a **monopoly** or **oligopoly** market. In such markets, producers can manipulate either price or quantity to maximise their profits, and barriers to entry into the market (such as branding and high set up costs) mean that resources are not as mobile and therefore supply can be restricted more readily.

The discussion of markets and technical efficiency to follow will also illustrate that the competitive market will tend to result in lower prices for consumers. It will show how competition encourages firms to offer their products at the lowest possible price. By doing so, competition can result in an increase in **purchasing power** (the volume of goods and services that can be purchased from a given income). It is assumed that if a consumer can increase their access to goods and services, then their material living standards can increase. Through better use of resources and more efficient production techniques, the market promotes improvements in satisfaction (making someone better off), without making anyone else worse off. Therefore, competitive markets will tend to improve allocative efficiency. In contrast, if competition is reduced due to an increase in the level of concentration in markets, prices will tend to be higher and consumers will experience a reduced ability to access those goods and services that could maximise their wellbeing.

How competitive markets affect technical efficiency

A competitive market also imposes a discipline on firms to seek the least cost **method of production**. Given that the products offered for sale in a competitive market are assumed to be homogenous, one of the most effective ways to attract customers is through offering the lowest prices. By looking at their cost structures and identifying wastage in their production processes, the firms may be able to change work and management practices and make use of available technology such that **productivity** improvements are made. This means that existing resources (or possibly fewer resources) can achieve higher production volumes, thereby achieving higher levels of **technical efficiency**. When technical efficiency increases, the cost to produce each unit tends to fall (assuming other input costs are held constant), which means that technical and allocative efficiency can be compatible goals.

How competitive markets affect dynamic efficiency

It has been shown that competitive markets are more likely to achieve allocative efficiency when compared to any other economic system used to allocate scarce resources. **Dynamic efficiency** could be redefined in terms of allocative efficiency. It could be thought of as the ability of an economic system to move to a new allocatively efficient point following a change in conditions of demand and/or supply in the shortest amount of time and with minimal disruption as the economy restructures. When there is a change in demand and/or supply conditions, a new set of relative prices will be determined. The degree to which an economy is dynamically efficient will therefore depend on how quickly markets respond to the changed conditions by reallocating resources into the now relatively more profitable (more desired) areas of production.

In competitive markets, it is assumed that the movement to the new set of equilibrium prices will happen relatively quickly when compared to an alternative system. Suppliers, who are constantly monitoring price changes, will seek to move resources into more profitable activities as quickly as possible. As noted above, there is an assumption that resources are mobile and can be substituted into different production uses, because there are relatively low set up costs. Therefore, it should be relatively easy for firms to change their production processes and focus their efforts on the more profitable areas. This means that increases in demand can be met, because new competitors will enter the market as the relative price of a product increases. (As noted earlier, it is much more difficult for new competitors to enter the market in less competitive market structures.) Given that the effectiveness of the competitive market system relies heavily on price changes and firms are looking always to maximise profits, it is in their interests to constantly change the types of products they supply so they don't miss out on any profit making opportunities. If the price system was not employed and resources were allocated according to a planning system, the government may still try to meet the needs and wants of the people, but the lack of clear price signals may hamper their efforts because they would have less information on which to base their decision. Their decision making may also be distorted by the activities of lobby groups and it would be quite easy to misread what the true desires of the public are.



How competitive markets affect inter-temporal efficiency

Inter-temporal efficiency is achieved when there is balance between current and future levels of societal satisfaction. If we are to achieve intertemporal efficiency, living standards for future generations should not be jeopardised by the actions of current generations.

This might mean that the economy saves enough of their income in the present, so that investment projects that expand the productive capacity of the economy can be funded. These investments ensure that future consumption levels can be maintained or increased. If, on the other hand, there was excessive consumption spending in the present, the level of investment might decrease. The market system should operate to promote some form of inter-temporal efficiency via money markets, but this will be determined by the preferences of the current generations (since future generations are not able to express their preferences because they cannot participate in the current market). Nevertheless, the market will adjust to excessive levels of spending in the economy in the present. If there is excessive spending and not enough saving, the money market may experience a shortage of funds that are available for investment. Given that some firms will want to access these funds, the demand for money may be greater than the supply. This shortage will therefore promote an increase in interest rates (in simple terms, the price of money). The higher interest rates will help to rebalance the level of spending in the economy, because the incentive to save will increase. There will also be an increase in the

opportunity cost of spending. This may promote a more inter-temporally efficient outcome. However, if there is a low level of government intervention such that all decisions regarding balance between current spending and investment are left to the market, this might mean that essential infrastructure is neglected. Because essential infrastructure promotes inter-temporal efficiency, a lack of current spending in this area will worsen inter-temporal efficiency. Infrastructure is an example of a product that conveys positive externalities which will be discussed in section 3.4.

Inter-temporal efficiency also takes into account the **sustainability** of economic actions. The market system may fail to promote inter-temporal efficiency because the needs and wants of future generations cannot be directly considered. While those who are currently alive may prefer sustainability, the market will only respond to changes in behaviour that reflect **effective demand**.

Therefore, a person might *like* to conserve the forests in their local neighbourhood. If, however, they also want to *purchase* cheap furniture and they proceed to buy that cheap furniture, they send

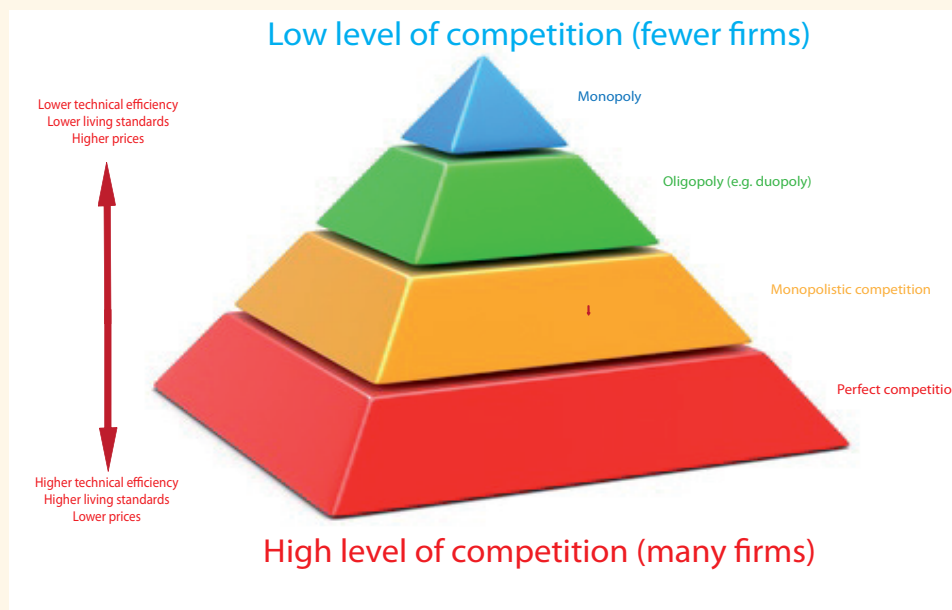
a clear signal to the producers that they are happy for the trees to be cut down. The market has a number of drawbacks that means that the relative prices do not always reflect the full costs and benefits associated with the production and consumption of a product. Some of these costs and benefits are 'externalised' as will be explained in section 3.4. The examples discussed throughout the chapter will illustrate how there will be an overproduction of goods and services that tend to be environmentally damaging (and which reduce the likelihood of economic actions being sustainable) and an underproduction of those goods and services that could help to promote improvements in living standards in the long run. It has been argued that the market system is therefore somewhat short sighted and without government intervention, the needs of future generations may effectively be ignored.

Study tip

Units 3 and 4 students should ensure that, when answering questions about the effect of factors or policies on 'efficiency', they clearly specify the effect on one or more of the specific types of efficiency covered in this section.

Activity 3a: Benefits of competitive markets

As indicated in the diagram below, the higher level of competition in a market, the larger the number of firms, as



characterised by perfect competition. The reverse is also true – the lower the level of competition in a market, the smaller the number of firms, as characterised by oligopoly and monopoly.

Based on the information contained in the diagram below, answer the questions that follow:

Questions

1. Explain why (perfectly) competitive markets are likely to lead to a more efficient allocation of resources. In your answer, refer to:
 - a) Technical efficiency
 - b) Allocative efficiency
 - c) Dynamic efficiency
 - d) Intertemporal efficiency
2. Outline why (perfectly) competitive markets are likely to result in lower prices and higher living standards.
3. Discuss the impact that more concentrated market structures like oligopoly and monopoly might have on efficiency in the allocation of resources..

Review questions 3.1

1. Describe what is meant by the term 'highly competitive.'
2. Explain how the existence of a large number of buyers and sellers in a competitive market helps to ensure that markets are highly competitive.
3. Explain why perfect information is important for competition.
4. Explain why the offering of homogenous products results in lower prices for consumers.
5. Discuss the importance of low set up costs and factor mobility for the competitiveness of a market.
6. Explain how a competitive market promotes an allocation of resources that maximises the needs and wants of society.
7. Explain how competitive markets 'impose a discipline' on firms, such that they seek the least cost method of production. Link this outcome to the concept of technical efficiency.
8. Explain why an 'allocatively efficient' allocation of resources requires the market to be dynamically efficient.
9. Evaluate the following statement: 'Competitive markets fail to achieve inter-temporal efficiency'. (You are encouraged to revisit this important question once you have completed the chapter).
10. Before you read the section on market failure, try to brainstorm a list of examples where the market system may promote the production and consumption of goods and services that don't necessarily maximise society's collective wellbeing.

Activity 3b: Digital disruption, competition and efficiency

One of the key ways that businesses can stay competitive and continue to attract valuable customers is through innovation. We are living, however, in a period of time where this is becoming increasingly challenging due to digital disruption. Digital disruption is described as a process whereby businesses discover a better way to meet the needs and wants of the consumer through the use of emerging digital technologies and models. The new method is often cheaper to implement and quicker, and in some cases provides a new good or service that may have not been imaginable in the past.

Digital disruption has the potential to increase competitive pressures in the market. For example, the legalisation of Uber in Victoria in 2015 changed the structure of the taxi market significantly. Costs of production were effectively reduced as regulations were relaxed for all participants and the increased levels of competition resulted in lower prices and better services for consumers, helping to increase the level of collective satisfaction.

Digital disruption involves innovating such that traditional methods of production and consumption may become redundant. Examples prevail all around us. Think about how online stockbroking significantly reduced the cost and effort required to buy and sell shares. How has streaming changed the music distribution business? The excessive profits made by record companies are now a thing of the past as the revenue that was once derived from physical sales disappears. Real estate agents are also facing digital disruption with new start-ups offering to help the vendor to sell their house using available technology - and at a fraction of the price charged by their rivals.

The rapid change that occurs in business models highlights how technology can contribute to improvements in dynamic efficiency. Businesses that engage in effective research and development may identify inefficiencies in current methodologies and move society towards the consumption of products that can elevate the human experience. Many areas of digital disruption have helped to reduce market power, exert downward pressure on prices and increased the ability of households to access a wider range of goods and services. Consider the following examples:

- As students of economics, you can access up-to-date news articles at virtually zero cost (and it is assumed that this will enhance your wellbeing).
- You might be able to make more informed health decisions using the wide range of information on the internet (potentially saving money on doctor's bills and/or improving your understanding of medical advice).
- Massive Open Online Course (MOOC) has the potential to increase access to education. This could flow through to productivity growth in the future and significantly reduces the private costs associated with learning.

Questions

1. Choose a key market that has faced digital disruption. Undertake some online research on the market.
 - a. Describe how the market has become more competitive (based on the characteristics of a competitive market).
 - b. Explain how the disruption to the market has affected the prices paid by the consumers.
 - c. Explain how the disruption may have led to a more efficient allocation of resources.
2. Choose a different area of digital disruption.
 - a. Explain how this market is now more able to respond to changes in consumers' tastes and preferences (more dynamically efficient).
 - b. Discuss at least one negative outcome associated with your area of digital disruption, such that there is potential for living standards to decline.



3.2 Market Failure

In Chapter 2 and section 2.1, it was demonstrated how markets can be very effective and efficient at allocating the nation's scarce resources. This is linked to the fact that consumers and producers, assumed to be acting in their own self-interest, participate in mutually beneficial transactions which promote allocative efficiency. To reach this conclusion, several additional assumptions were needed. It was assumed that the markets were perfectly competitive. In reality, few markets are able to meet the conditions needed for this classification and there are often barriers to entry and rigidities (lack of flexibility) in the way prices are determined. In addition, the perfectly competitive model does not take into account the impact of buyers' and sellers' (consumption and production) behaviour on third parties. We also assumed (intrinsically) that the products being sold were 'private goods', where consumption by one consumer naturally excluded someone else from consumption and where the private consumer had to pay for the product in order to access it. Finally, we assumed that consumers and businesses were fully informed and made decisions based on all of the available information. Some goods and services also have unique characteristics that mean that they are not traded in a traditional way.

All of the assumptions for a competitive market are unlikely to be met in most markets, which means that **market failure** may result.

What does market failure mean?

Market failure occurs when the allocation of resources achieved in the economy is inefficient (or where resources are allocated in such a way that national living standards or welfare is not maximised). In practical terms, this means that unregulated markets will lead to an over-allocation of resources to the production of some goods and services and an under-allocation of resources to the production of others relative to that allocation that would maximise society's welfare. It is likely to mean that:

- The right combination of goods and services is not produced
- People (who it could be argued are behaving irrationally) purchase goods and services that don't necessarily maximise their wellbeing (if both the short run and long run are considered)
- The most efficient production techniques are not employed
- The allocation of resources may hamper the ability to achieve sustainability goals
- It would be possible to achieve higher standards of living without making someone worse off.



The existence of market failure does not usually lead to the conclusion that economies should abandon markets as the primary instrument by which to allocate scarce resources. Most economists still see the market as the most effective way to achieve efficient outcomes; however, to achieve its full potential, the market sometimes needs to be modified with some forms of **government intervention**. The following four sections identify four situations that cause the market to allocate resources inefficiently and the government interventions that are undertaken to correct these inefficiencies.

Review questions 3.2a

1. Briefly explain why all of the conditions for a perfectly competitive market are unlikely to be met.
2. With reference to two types of efficiency, explain what is meant by the term market failure.
3. Explain briefly why 'the existence of market failure does not lead to the conclusion that economies should abandon the market system altogether.'

3.2(i) Public Goods

Most goods and services are allocated in markets where there is an exchange of value taking place - where the buyer and the seller are each exchanging something of value to them. The consumer is willing to utilise some of their income because they receive a benefit from consuming the product. The supplier needs to receive payment to reward them, in part, for taking the risk to bring the product to the market and to cover their costs of production. The relative price of any good or service therefore provides a valuable signal to consumers and producers and helps to allocate resources to the highest end-use (the products that provide the highest level of collective satisfaction).

The existence of **public goods** in the market results in an inefficient outcome. To understand why public goods cause market failure it is first important to recognise its unique characteristics and contrast these to those of a private good.

Private goods have two defining characteristics. Firstly, they are **rivalrous** or **depletable** in consumption. This means that consumption by one person reduces the amount that is available for another person. If a person purchases and then drinks a green smoothie, then each mouthful results in less being available for someone else. A private good is also **excludable**. This means that the supplier of the product can legally stop someone from consuming the product unless they pay the price offered in the market. A person who does not pay for the green smoothie will not be able to legally consume one (they might be able to consume one at home but they would still need to purchase the ingredients and the tools to make one). Most products in our markets are private. You don't get the product unless you pay for it, and once consumed, it cannot be consumed by anyone else. The demand and supply analysis for Chapter 2 was based on markets for private goods and services.

Public goods, in contrast, have opposite characteristics. They are **non-excludable** which means that the supplier cannot stop a person from consuming/using the product (even if they have not paid). A public good is also **non-rivalrous** (i.e. **non-depletable**). This means that consumption by one person does not lead to a reduction in the amount available for other potential consumers.

Table 3.2 below includes some products that are considered to be public goods. For each, it would be very difficult to exclude users from receiving the benefit of the product, and consumption by one person or group does not reduce the amount available for others.

Table 3.2: Examples of public goods	
A lighthouse	Border control
Police force	National defence
Street lights	ABC TV and radio broadcasts
Prisons	National security



From an individual's perspective, it may be **utility maximising** (the private benefit to them) to consume the product without paying for it (and given that the product is non-excludable, this option is possible). This leads to the **free rider problem**, where a free rider is a person who receives the benefit from a public good but does not pay for it. Instead, they rely on others to pay for and provide the incentive for suppliers to offer it to the market.

However, the existence of free rider behaviour means that the market will tend to under-allocate resources to those goods where the producer cannot charge all end-users. Capitalists, who are looking for profit-making ventures, would be reluctant to enter an industry where they could not charge their customers enough to at least cover their (opportunity) cost (i.e. the amount they could have received had they produced something else instead). As a result, the producers will choose to allocate scarce resources elsewhere (more production will be directed towards private goods where higher profits can be made). This means that society misses out on the opportunity to consume this valuable product, meaning that there is an **under allocation of resources** to its production (compared to the allocation that would maximise society's collective wellbeing). The under allocation of resources to the production of the relevant good or service means that allocative efficiency is therefore not achieved.



The provision of 'defence' for the citizens of a country is a traditional example used to discuss the nature of a public good. If defence were to be provided privately, the provider(s) would need to be able to charge each consumer a price equal to the value that they placed on it (perhaps through a subscription fee). Given that the defence force is unlikely to be able to choose who it defends in the event of war, many 'rational' consumers might decide to 'free ride' and let others pay for and provide

the service. (This would be utility maximising at an individual level because they would still gain from the provision of the defence service and have extra discretionary income available to allocate to other areas of consumption.) There may also be a number of citizens who do not have a capacity to pay the fees due to low income. Despite not paying, consumers will expect to enjoy the benefits of defence. Consequently, the market (if operating freely) would tend to under allocate resources to the defence force, leading to an inefficient allocation of resources. In reality, most of the population will value a well-resourced defence force, but it is impossible to determine exactly how much value society places on this public good simply through the market, because the market system cannot provide accurate price signals. Whether the amount allocated to defence is too small or too large is open to debate, but with government intervention (which will be discussed in the next section) the outcome is generally seen as more efficient. (This assumes that the voting intentions of the population accurately reflect their preferences for these types of public goods.)

Government intervention: Public Goods

Government subsidies

The Government will intervene in those markets where the benefits associated with the provision of public goods exceed the amount provided by the free market. They will therefore need to estimate the value society places on a public good and seek ways to increase the amount of resources that are allocated to the production of the good or service. This might mean that they provide generous subsidies to private suppliers so that they can cover the costs of their operations (including their opportunity costs). A **subsidy** usually takes the form of a direct cash payment from the government but it can also take the form of low or no interest loans, subsidised costs (such as tax-free petrol) and other grants. To work effectively, the government provides enough income to the supplier so they can offer the product to the public for free. For example, street lights may be produced by private companies but rather than charging the individuals who might benefit from the improved safety conditions, they receive their revenue directly from the government.



Direct Government provision

Alternatively, the government can simply take full responsibility for the provision of the public good. They become the national producer, which is the case for the defence force. The government employs the defence personnel and purchases the necessary defence equipment and munitions from the market so that it can provide the service itself. By entering the market as a producer of this public good they alter the allocation of resources. More resources that may have been allocated to the production of other goods and services are now allocated towards the production of defence. For example, to attract suitable labour resources, the government may offer favourable wages and employment conditions that provide an incentive for people to work for them. This means that this labour cannot be allocated to an alternative area of production in the economy (there is an opportunity cost). Through their intervention in the market to alter the allocation of resources, it could therefore be argued that government has improved society's wellbeing. In the free market, the defence force may be insufficient (or non-existent) making the country vulnerable to an external attack. This could increase the level of anxiety of the general community, and, in the event of an external attack actually eventuating, living standards could be significantly compromised.

Governments also provide lighthouses so that ships do not enter dangerous areas, street lighting so that streets are safer at night and emergency services. Some privately-provided goods may exhibit the characteristics of public goods. For example, television broadcasts are services with public good characteristics because the consumption by one individual does not deplete the quality of reception available to another. Once a person has purchased a television and an aerial they cannot be excluded from receiving the free-to-air signal - which they can in the case of Pay TV or streaming services. The consumer of free-to-air TV does not pay directly because the provider of the service is able to charge for advertising space. In this case the market has found its own appropriate solution and the broadcasting companies offer advertising space so that they can earn the revenue needed to cover their costs of production and make a profit high enough to keep them in the business.

Review Questions 3.2b

1. With reference to the key characteristics of each good, distinguish between a private and a public good. Provide three examples of each type of good.
2. Explain why the characteristics of a public good can lead to the 'free rider' problem.
3. With reference to your answers to questions 1 and 2, explain why the market fails to allocate enough resources to the production and consumption of public goods. Link your response to the achievement of allocative efficiency.
4. With reference to a particular example, explain how the government intervenes in the market to alter the allocation of resources to achieve a more efficient outcome.

Activity 3c: Are our roads a public good?

As highlighted in section 3.2(i), a public good has two key characteristics that lead to an insufficient allocation of resources devoted to its production. It might seem, at first glance, that most roads in Australia are non-excludable, given that it is possible to drive (or ride your bicycle) on a road without incurring any direct payment. Similarly, roads might also appear non-rivalrous/non-depletable, given that one's use of the road (particularly country or regional roads) does little to reduce the enjoyment or ability of others to use those same roads. It therefore suggests that a road meets the criteria to be considered non-rival/non-depletable in consumption.



In contrast, however, many of you will have experienced road congestion in built up/city areas (especially during peak times).

While it is still 'free' to use the road, during peak times the use by one person does indeed reduce the ability of others to use the road. This means that at 3am the road might be non-rivalrous/non-depletable, but at 8am on the same day, the road effectively becomes rivalrous/depletable, and develops fewer 'public good' characteristics.

With respect to the other public good characteristic of non-excludability, it has always been theoretically possible to exclude non-payers from using some roads (e.g. those roads on private property). This meant that roads were theoretically excludable and therefore did not meet the criteria to be considered a public good. However, the difficulty/complexity involved in charging for the use of public roads meant that in practical terms, roads are typically considered to be non-excludable. However, advances in technology have meant that, increasingly, roads are becoming more excludable, with companies (e.g. Citylink and Eastlink) already able to charge users via 'e-tags' when travelling on toll roads. One can also envisage a future where 'smart cars' will have the technology to facilitate an electronic payment for the use of all public roads – a truly 'user pays' road system using GPS tracking in vehicles. As a consequence, the public good characteristics of roads will be less evident as 'roads' increasingly become 'private goods'.

Currently, the government in Australia attempts to charge road users indirectly by levying a fuel excise tax and registration fees. This means that those who drive vehicles that consume more fuel will pay a greater share of the cost. It might also mean that bicycle users get to continue to use the roads for free (and are less likely to suffer from congestion problems).

Over time, the government has recognised that the fuel excise charged is contributing less and less to revenue as cars become more fuel efficient. This is expected to continue with the real value of fuel excise expected to fall by 45% by 2050 (by which time a large percentage of cars will be electric). When he was Prime Minister, Malcolm Turnbull suggested that a more effective way to address this problem would be to charge drivers based on their usage (as described above). As this becomes more possible over time, it highlights how innovation can both cause problems for governments and herald new solutions. For example, it is likely to be problematic for the government to rely on the same methods to finance key infrastructure, like roads. However, the 'user pays' solution using the latest technology might be fairer and also help to solve the problems associated with falling revenue - revenue that is needed to fund key infrastructure projects that facilitate growth in economic activity.

Questions

1. Distinguish between a private and a public good. Based on these definitions, provide examples where a road might meet the definition of a public good and examples where the road better meets the definition of a private good.
2. Explain whether the roads you travel on to get to school are private or public goods.
3. Why would there be an under allocation of resources to the production of roads in an economy that is purely driven by market forces?
4. Identify and explain one form of government intervention that could promote a more efficient allocation of resources (with respect to the provision of roads).
5. Explain why advances in technology have resulted in roads becoming more excludable and therefore less like public goods.
6. Evaluate the proposal to charge road users based on the kilometres travelled. (Consider arguments for and against the proposal before reaching a conclusion. Ensure you use economic reasoning and terminology in your response.)

3.2(ii) Externalities

When a person buys and consumes a product, it is reasonable to expect that he or she derives some benefit from doing so (i.e. the person's utility is increased). When a firm produces a good or service, it is normal for them to incur costs. Sometimes a producer or consumer (referred to throughout this section as the 'third party') may incur a cost or receive a benefit, even when they are not involved in the transaction (or production or consumption activities).

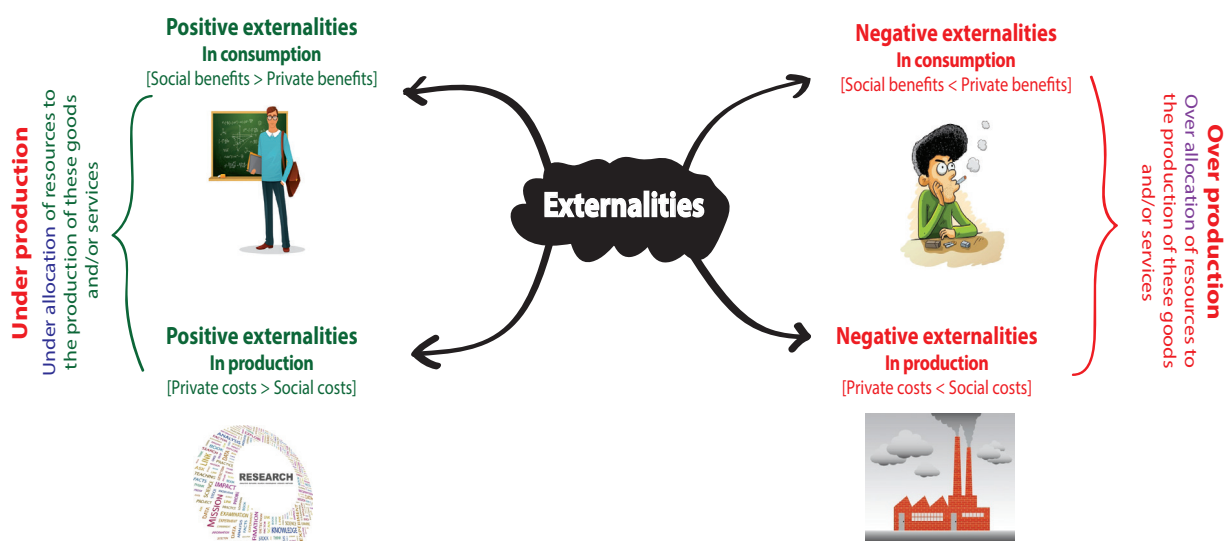
An **externality** arises when a person is engaged in a transaction (or activity) that affects the wellbeing of a third party who is not involved in the transaction (or activity). Externalities are sometimes referred to as **spillovers**. Externalities can be positive or negative and can occur in either the production or the consumption of a good and/or service. A **positive externality** occurs when the third party (consumer or producer) receives a benefit from the production or consumption of a product. A **negative externality** occurs when a cost is imposed on a third party not involved in the transaction (or activity).

Buyers and sellers tend to neglect the impact of externalities when making decisions about production and/or consumption, which means that the market outcome will not always be efficient. Before the positive and negative externalities are considered, it is worth discussing the difference between private and social costs and private and social benefits.

When considering any production activity, there are two types of costs that will be considered. Most businesses usually only consider their **private costs** (which includes the money they need to spend to make each additional good or service plus the opportunity costs). The costs of production have a huge influence on the position of the supply curve as discussed in Chapter 2. On the other hand, economists also refer to the concept of **social costs**, which takes a more holistic view of production. Social costs will therefore be higher if there is a cost associated with production that is not incurred (i.e. paid for) directly by the producer. In contrast, social costs will be lower if the production activities convey a benefit on others that they do not have to pay for.

Private benefits are usually discussed in relation to consumption and relate to the marginal utility that a person receives from consumption (the extra increase in utility arising from an extra unit of consumption). Economists, when evaluating the merit of consumption, will also consider the **social benefits** that may be associated with consumption of goods and services. Any consumption activities that provide a third party with a benefit will lead to additional benefits for society such that the social benefits will be higher than the private benefits. Consumption activities that reduce the living standards of third parties will have a lower social benefit than the private benefit. Figure 3.1 illustrates the nature of externalities in terms of the differences between private and social costs/benefits.

Figure 3.1



In relation to goods and services with positive externalities, it highlights that an unregulated market would devote an insufficient volume of resources to the production of these goods and services, resulting in under production. In contrast, for those goods and services with negative externalities in production, the unregulated market would devote too many resources to the production of these goods and services, resulting in over production.

Positive externalities in production

A **positive externality in production** occurs when a firm produces a good or service that provides benefits (directly or indirectly) to another economic agent (e.g. a consumer or another business) not involved in the transaction. The firm which has chosen to produce the product will only consider the potential revenue they can extract from their paying customers and compare this to the costs associated with production. In the case of positive production externalities, the social costs are less than the private costs associated with producing the product (because the external benefits do not reduce the private costs of production). Therefore, in a free market the producers will tend to under allocate resources to the production of goods and services that have positive production externalities. The higher private costs (higher than social costs), means that the decision to allocate resources has not been made with reference to the overall level of societal cost.

Examples of positive externalities in production

If a firm undertakes **research and development**, it may eventually result in the production and implementation of new technology. The firm itself may benefit from the sales of the new technology but the technology is also likely to be beneficial to other firms and consumers who do not have to pay for the research and development. The firm may not be able to extract the full benefits from the research and development that they undertake so the social costs of their production activities are less than their private costs.

Positive externalities in production can also occur when a **beekeeper** sets up near food producers (such as fruit growers). The bees will pollinate the nearby fruit trees and increase their yield, but the farmers, in some cases, will not have to pay for the bees' 'work'. Having the beehives nearby therefore reduces the cost of production for the fruit producer (which flows through to the availability and the price of fruit for all consumers). The beekeeper's costs of production may not be improved by this activity meaning that society's costs (they get cheaper fruit) are not considered when the beekeeper allocates resources to honey production. As it turns out, the positive externality does work both ways because having access to good quality fruit trees will improve the quality and quantity of honey available.

A firm may also undertake **training** of their workforce to improve production outcomes, such as through improvements in production techniques and communication. If an employee, whose skills have been improved by this training, should leave the organisation, another firm will enjoy those benefits. Firms may therefore be reluctant to undertake extensive training (a significant cost) because other firms (and society at large) enjoy the benefits. This means that society benefits more from the production activities that are focused on training than the individual or business paying for the training.



Positive externalities in consumption

A **positive externality in consumption** occurs when the consumption of a good or service improves the wellbeing of another consumer or producer (who is not involved in the transaction). This means that the private benefits associated with consuming the product are lower than the total benefits experienced by society. The market is unable to allocate enough resources to the products with positive consumption externalities because it is not possible for the firms supplying the products to charge the price that represents the value to all of the external beneficiaries. Illustrative examples:

Examples of positive externalities in consumption

In a free market, demand for **vaccinations** may be lower than the socially optimal quantity. The producer of the vaccines would need to ensure they charge the customer enough to cover their costs. When a person receives a vaccine, they are likely to experience an increase in their long-term living standards because they are protected from contagious diseases, which, if contracted, could reduce their earning capacity and enjoyment of life in the future. However, some people who do not pay to have the vaccine will also benefit because the vaccinated people reduce the viability of the disease. It is much more difficult for it to spread when there are less potential carriers. (This is referred to as 'herd immunity' – because the whole 'herd' of humans is better protected if the majority is vaccinated to promote immunity.) The total benefit received by society is therefore greater than the total value of all private levels of consumption. As a result, the market tends to underprovide vaccines because it is not in firms' interest to produce the socially optimal quantity of the product if the private demand is insufficient.

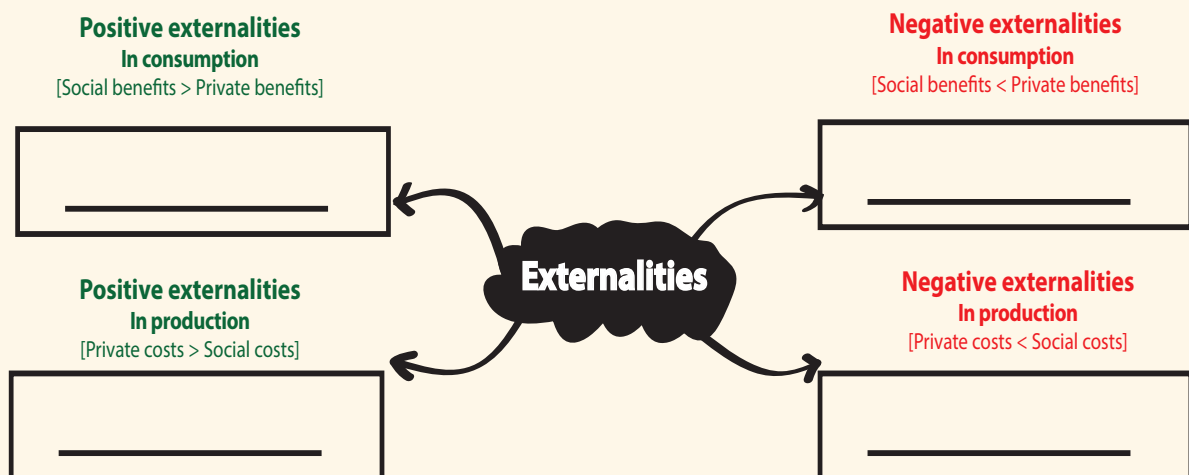
Education is also a service where there are extensive positive externalities in consumption. The person who receives the education service will enjoy a multitude of private benefits, which might include a better understanding of how the world works and an increased earning capacity in the future. Society also benefits from having a more educated workforce because the labour force is likely to be more productive, unemployment rates are likely to be lower, crime rates will tend to be lower and people will usually experience better health outcomes. Therefore, the benefits to society from education exceed the individual benefits. The provider of the education can only charge what the individual is willing and able to pay (which is assumed, quite unrealistically to be linked to the benefits they expect to generate from such consumption). This means that the demand for education would be much lower in a free market (a completely user-pays system). Society's wellbeing would not be maximised, as the full benefits of having a widely educated population would not be achieved. In countries where governments have limited funds and families live in poverty, education access is often lacking. This, in many cases, prevents the economy from developing and reduces the ability of people to move out of the poverty cycle.

All positive externalities in consumption or production will ultimately lead to an **inefficient allocation of resources**. Too few resources would be allocated to the production and consumption of the relevant good or service and the socially optimal allocation of resources would not be achieved. This means that the relevant goods and services would be **underprovided** without some form of government intervention that is designed to **internalise** the positive externalities.

Activity 3d – Externalities

Place each of the four examples listed below into the appropriate boxes on the diagram below.

- Beekeeper
- Vaccination
- Coal fired electricity
- Loud music at party



Explain why an unregulated market would tend to over produce or under produce the relevant good or service. In your explanation, make reference to the difference between private costs/benefits and social costs/benefits.

Government intervention: Positive externalities

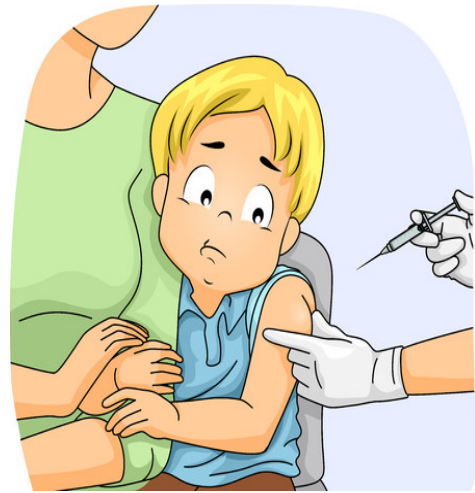
As discussed in Chapter 2, the equilibrium price and quantity traded for each market will determine how resources are allocated in an economy. When there are positive externalities in production and/or consumption, the allocation of resources will be sub-optimal because the market is unable to capture the external benefits that arise. Those who receive the benefits are not required to pay and it would not necessarily be rational for recipients to do so. Therefore, the government may intervene in free markets either directly or indirectly to increase the production and consumption of goods and services that convey external benefits. They will attempt to increase demand and/or the supply of the product in the market place to ensure that a more socially optimal level of production takes place. To achieve this aim they can intervene in one or more of the following ways:

Government Regulation

A **government regulation** is a law that can ban production or consumption of certain activities or impose requirements on producers or consumers if they want to engage in certain activities. One way governments can use legislation to increase the production and consumption of products that convey external benefits is by making certain types

of activities mandatory. They may also impose certain conditions on the use of other goods and services that also promote the consumption of goods and services with positive externalities. Consider the following examples:

- Australia has in place legislation that makes education compulsory between the ages of 5 or 6 and 16. This creates demand for, and production of, education services, some of which might not be present in a free market. The demand curve shifts to the right and the equilibrium quantity sold increases. This brings society closer to the socially optimal level of education.
- In January 2016, the Victorian Government introduced a new law they called ‘No Jab, No Play’. The aim of this legislation was to promote infant vaccinations. Those households who wanted their children to attend childcare must be up to date with the per-age schedule as determined by the Federal Government. Commonwealth childcare subsidies (where the government pays for a portion of a family’s childcare) are also denied if the child is not vaccinated. This is referred to as ‘No Jab, No Play.’



Advertising

Governments can utilise taxpayer funds to create advertising campaigns that promote the consumption of goods and services that convey positive externalities. The government may be trying to reduce the degree of ignorance about the potential benefits by providing meaningful information (so that the consumer can make a more informed decision). Consider the following examples:

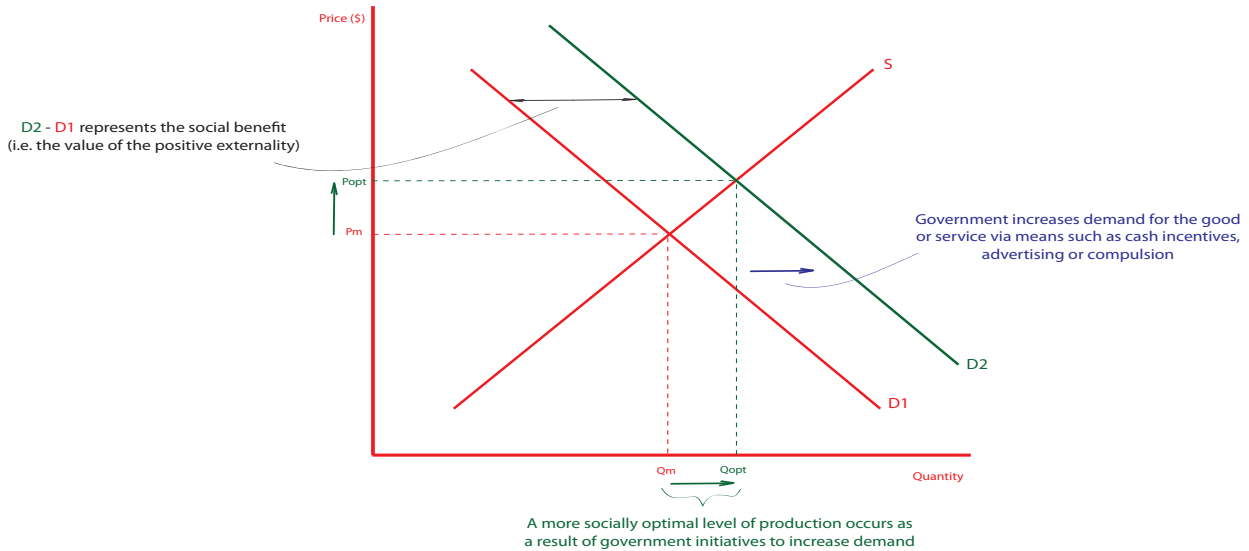
- A society that undertakes preventative healthcare measures will tend to be more productive, as fewer working days will be lost in the future, and if people’s immune systems are stronger they may be more resistance to communicable diseases and infections. One of the Federal Government’s key initiatives in this area is ‘A Healthy and Active Australia’ which promotes healthy lifestyles through informing the public on healthy eating and the most effective types of exercise. Eating foods that are high in vitamins and minerals will tend to have positive externalities, so attempts by governments to inform people of their benefits should lead to an increase in demand and greater consumption. This is then likely to lead to a reallocation of resources that promotes an increase in **allocative efficiency**. Other information campaigns that have been implemented by the government include:
 - The promotion of cancer screening to protect health through early detection. One specific example is BreastScreen which provides free services for women. The most recent campaign has focused on women between the ages of 70 and 74, as this group were not using the services as much as younger generations and the chances of cancer increase with age
 - The ‘Fight Flu’ Campaign that encourages those who are most at risk to receive their annual influenza vaccination
 - The ‘Girls Make You Move’ campaign that encourages young women and girls to engage in more physical activity (free vouchers to gyms were offered as part of the program)
 - SunSmart campaigns that are designed to reduce the risks associated with exposure to UV rays that can lead to skin cancer



Each of these campaigns, if successful will help to promote improvements in health outcomes. A healthy person not only enjoys a higher standard of living but they are also likely to be able to contribute more positively to the economy. In addition, those who interact with the healthy person may also experience intangible benefits.

Both advertising and legislation are designed to shift the demand curve for products with positive externalities to the right. This is illustrated in Figure 3.2 where the quantity traded for the good or service increases from Q_m to Q_{opt} , where Q_m is the free market level of production and Q_{opt} is the quantity produced after the intervention. The use of ‘ Q_{opt} ’ highlights that the new quantity produced is closer to the optimal allocation of resources because society’s wellbeing has been improved through this intervention.

Figure 3.2



Subsidies (and direct provision)

The government can also intervene in the market to reduce the private costs of producing the goods or services in order to encourage production and consumption and therefore internalise the positive externalities.

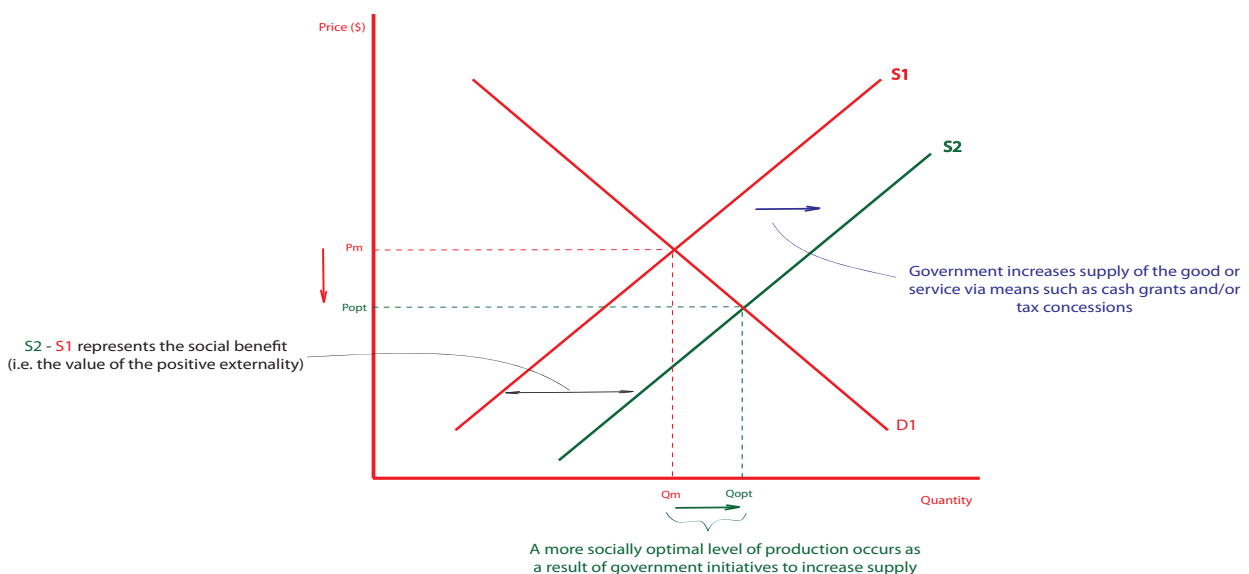
A subsidy is a payment made, usually to the producer of a good or service that effectively reduces their cost of production. This will shift the supply curve to the right because it is now possible to supply more at each given price level. Governments can also help to subsidise private costs by granting tax relief to producers or offering low interest rate loans. When the supply curve shifts to the right this puts downward pressure on prices because it creates a surplus at the existing price. The falling prices will naturally tend to create an expansion in demand and the quantity traded in the market increases.

Study tip

Economists often refer to the difference between marginal private benefits/costs and marginal social benefits/costs when attempting to illustrate externalities. Reference to this type of marginal analysis is beyond the scope of the VCE Economics course.

This is reflected in Figure 3.3 which shows how the shift in the supply curve results in an increase in the quantity traded increasing from Q_m to Q_{opt} where Q_{opt} reflects the fact that society has now allocated more resources to the production of this type of product and it is now operating closer to the allocation that optimises society's wellbeing.

Figure 3.3



Examples of government intervention to account for positive externalities

In most countries around the world, including Australia, the government is involved in the **direct provision** of both education and health care. The positive externalities associated with health care are so large that the government does not want to leave it to the private sector. For some forms of education and health care, the government intervention reduces the price to zero, such that any person who needs or wants the service can choose to access it.

Private schools in Australia are also some of the most highly subsidised in the world. The Federal Government allocates more per private school student than to each public school student (although the majority of the funding for secondary schooling is provided by State governments). The Government argues that this **investment in education** leads to better educational outcomes because it creates a more competitive market and allows schools to cater for students with different learning needs. A more educated population - either through private or public schooling - should create benefits for society in terms of higher productivity growth, reduced crime rates and a more 'cohesive and tolerant' society more generally. University education in Australia is no longer free (HECS was introduced in 1989) but is still heavily subsidised by the government.

The Government also provides large incentives for firms to undertake **research and development**. They have implemented changes to the taxation system such that those companies who engage in eligible research and development are entitled to a refundable tax offset. This effectively reduces the risk and costs associated with undertaking research and development, the result of which benefits not only the company but also other businesses and households in Australia.

Negative externalities in production

Negative production externalities occur when the production activities undertaken by suppliers impose costs on society. This might take the form of reduced living standards for individuals or higher production costs for other firms (which will ultimately mean that consumers may have to pay a higher price for seemingly unrelated products). When the firm decides how much of a good to produce, it will look at its private costs relative to the price that their products can be sold for in the market. They will not consider the costs to society that are the results of their production activities because they can externalise those costs onto a third party. This means that the amount they produce is deemed to be excessive (sub-optimal) from the perspective of society because at the point of production, the costs to society are greater than the benefits. There is effectively an over allocation of resources to the production of goods or services that cause negative externalities.

Examples of negative externalities in production

Imagine that a factory was set up next to a river. The river flows into a nearby lake where a trout farm operates. The factory, in order to reduce its costs of production, dumps its waste materials into the river, rather than dispose of it using more environmentally friendly methods. Their production activities are therefore imposing a cost on the trout farm downstream as the waste either kills the fish or makes them unfit for human consumption. Those who live along the river and utilise it for recreational activities also experience a decrease in their standard of living. The firm operating the factory, because it does not pay for these costs, will experience relatively low costs of production and will therefore be able to charge its consumers lower prices. Lower prices encourage greater consumption of the good or service so the product that causes the negative externalities is overproduced.



Most of the electricity produced in Australia is derived from coal-fired power plants. This requires fossil fuels to be burnt to generate the energy needed to power our homes, businesses and government operations. When carbon dioxide from burning the coal is released into the atmosphere it imposes costs not only on current generations but also future generations. Firstly, those who live near the power plants experience a significant decrease in their air quality. Particles in the air, for example, may be associated with the increased incidence of asthma and other respiratory conditions. Therefore, the individuals experience an increase in their medical bills (a measurable external cost) and a decrease in their enjoyment of life (which is much harder to quantify). Secondly, the release of carbon dioxide contributes to climate change, leading to longer-term costs imposed on the broader society as resources need to be diverted to tackle the negative impacts of climate change. The market price for electricity does not reflect the external costs and is therefore relatively low. This encourages excessive production and consumption of electricity in the free market and leads to an inefficient allocation of resources. Society's wellbeing could be improved. The external costs associated with the burning of fossil fuels are considered in the Chapter 3 Applied Economic Exercise.

Negative externalities in consumption

Negative consumption externalities occur when the purchasing decisions made, or activities undertaken by, consumers impose external costs on third parties. When the consumer decides to consume a good or service they are usually going to look at the private benefits associated with doing so. If the price paid is equal to or less than the perceived benefit of that extra unit of consumption, then they will choose to consume the extra amount (assuming they can afford to do so). Unfortunately, that consumption may impose a cost on another individual or on a business, and therefore society as a whole may be worse off. It could therefore be successfully argued that the benefit from private consumption is larger than the social benefits from the same activity (i.e. the rest of society experience a decrease in their living standards). This results in excessive consumption (an over allocation of resources to the production of the good) which is clearly sub-optimal because at the point of production the 'true' benefits to society are less than the costs involved in production.

Examples of negative externalities in consumption

When a person consumes a cigarette in public, those nearby will have little choice but to inhale the smoke passively. The toxins in the cigarette are passed from the consumer to the third party, imposing a cost upon them. This may immediately reduce the enjoyment of a meal, for example, and if the practice continues for a long time, the passive smoker might experience health conditions such as emphysema. The decision by the smoker has reduced the enjoyment of life and imposed unnecessary costs on a third party. The third party may have to allocate more of their future income to healthcare (rather than the consumption of goods and services that could add far more utility). In addition, the smoker will also have a higher probability of experiencing health problems. It has been well documented that smoking increases the likelihood of developing a wide range of cancers. The experience of cancer by the individual might be viewed as a private cost, on first consideration. However, cancer is very expensive to treat and therefore the rest of society will contribute to the treatment costs (assuming that the government provides this by using revenue from taxpayers). In addition, the potential workforce will be reduced and firms might experience decreased labour productivity. Therefore, the free market price of cigarettes is relatively low because the social benefits from consuming a cigarette are lower than the private benefits. Cigarettes are therefore over consumed and over produced in a free market, leading to an **inefficient allocation of resources**.



If you are trying to sleep at night and your neighbour is having a party, the noise pollution is a form of negative externality. The neighbour may not consider your wellbeing (the cost he or she imposes upon you), so the noise may be excessive for the relevant time of the evening. If the noise keeps you awake, then you may not be as productive at work the next day (which indirectly reduces society's wellbeing as well) and your stress levels are likely to be higher. From society's point of view, the negative externality leads to a **sub-optimal outcome** because technical efficiency could be lowered.

All negative externalities in consumption or production will ultimately lead to an **inefficient allocation of resources**. Too many resources would be allocated to the production and consumption of the relevant good or service and the socially optimal allocation of resources would not be achieved. This means that the relevant goods and services would be **overprovided** without some form of government intervention that is designed to **internalise** the negative externalities.

Government intervention: Negative externalities

Equilibrium in a free market determines how resources are allocated. Increases in demand for a particular good will generate increases in relative prices and act as an incentive for producers to increase production in the area (supply expands). Lower production costs will also generally result in an increase in the number of resources that are allocated to a product (because it shifts the supply curve to the right, leading to lower equilibrium prices and an expansion in demand). When negative production or consumption externalities exist, the market will fail to arrive at the socially optimal allocation of resources (too many of the goods and services are being produced and consumed). The government will therefore look to correct this market failure by intervening in the market. They will attempt to reduce the demand and/or the supply of the product in the market place to ensure that a more socially optimal level of production occurs. Consider the following approaches:

Government regulation

A government regulation may include a law that can ban certain production or consumption activities or imposes requirements on producers or consumers if they want to engage in certain activities. Many products and activities that cause negative externalities have been made illegal over time, such as:

- In 1987, CFCs (chlorofluorocarbons) were banned by governments around the world because their use contributed to the hole in the ozone layer
- In 2007, the Victorian Government banned the smoking of cigarettes in any enclosed public environment, helping to reduce the negative externalities associated with passive smoking
- It is illegal to light fires and burn off materials in your own backyard
- It is illegal to sell illicit drugs and it is illegal to sell alcohol to minors
- Single use plastic bags were banned in some states of Australia in 2018.

The government can also require people or businesses to modify their behaviour such as:

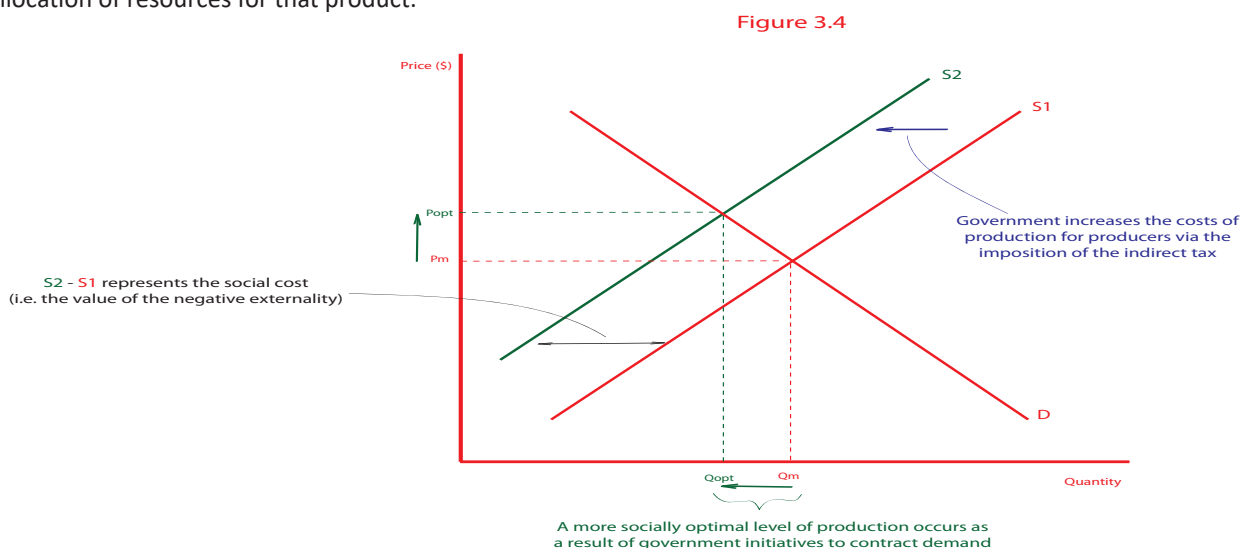
- Music venues that are located near residential buildings must have noise limiters fitted so that sound cuts out if it exceeds a certain decibel reading
- Cars sold in Australia must have catalytic converters installed. These help to reduce the toxicity of fumes released into the atmosphere when the car consumes petrol
- Governments may require that new buildings meet certain safety standards and reach a certain level of energy efficiency (which effectively reduces the number of future injuries that might occur and the level of pollution).

The abovementioned changes to legislation are often seen as more **'interventionist'** in nature because, rather than rely on the price mechanism, the government recognises that even with changes to relative prices, the desired outcome may not be achieved. In the case of CFCs, the optimal level of usage has been deemed to be zero as determined by agreements between world governments. The government may also undertake actions that are seen to be more **'market-based'**, in that they are designed to alter the structure of relative prices and thereby alter consumer and producer behaviour.

Indirect taxation

An **indirect tax** is a source of revenue for the government where the tax may be imposed on an intermediary (such as a producer or a retailer) but where the consumer will ultimately pay for most of it (especially if the product in question has a low PED - which was discussed previously in Chapter 2). Each consumer of the particular good pays the same amount in tax, irrespective of their income.

An indirect tax is usually imposed upon the producer. This adds to the cost of production for the producer. When the cost of production increases, the supply curve for the firm shifts to the left. At the existing price, this causes a shortage in the market (because demand is now greater than supply). The price will therefore have a natural tendency to increase, which means that demand will tend to contract. The new equilibrium price is higher and the volume sold in the market is reduced. Therefore, the government intervention has altered incentives for producers and consumers and the allocation of resources has changed. As Figure 3.4 illustrates, the production and consumption of the good has been decreased from Q_m to Q_{opt} , where Q_{opt} is an indication of the socially optimal allocation of resources for that product.



The most optimal outcome is likely to be achieved if the government is able to set the tax equal to the external costs. The aim of the indirect tax is to **'internalise'** the external cost such that those involved in the transaction ultimately pay for the costs that are imposed on society. For the producer, this additional cost might be reflected in lower sales and therefore lower profits from that activity and for the consumer it will be reflected in higher prices and therefore reduced purchasing power.

Examples of indirect taxes that have been implemented in Australia include:

- The **excise taxes on cigarettes and alcohol**. From July 2016, the government has been increasing the excise on cigarettes by 12.5% per year, for 4 years, such that the price of a packet of cigarettes will be close to \$40
- The **excise taxes on petrol** of approximately 40 cents per litre
- The **carbon tax** (2012-2014). This was initially \$23 per tonne of carbon emissions imposed on Australia's top 500 polluting companies.



Subsidies

The indirect taxes referred to above will ultimately raise the relative price of the good or service and encourage consumers to substitute into the consumption of products which have less harmful effects on society. The government can also accelerate the substitution away from goods with negative externalities by providing **subsidies** to the production of goods and services that cause fewer negative externalities. For example, in 2018, the Victorian Government announced a new initiative whereby they offered to pay for half the cost of solar panels or batteries for low and medium income households. Solar panels, once installed, cause no carbon emissions in the provision of electricity. Therefore, the households and businesses which install them reduce their demand for coal-fired electricity (which creates substantial carbon emissions). The change in the relative prices has therefore altered incentives and the negative externality (the damage to the climate from carbon emissions accelerating climate change) is reduced. Society has been made better off as the economy is allocating resources in a manner that is more likely to maximise living standards, both in the current period and the future. Councils across Victoria also implemented a scheme in 2018 to subsidise the cost of compost bins so that fewer food scraps were sent to landfill.

Study tip

Demerit goods are those that are considered harmful or 'bad' for the person consuming them. They are related to negative externalities in consumption but there is an important difference. Goods with negative externalities in consumption require third parties to be negatively affected. This is not the case for de-merit goods.

Government advertising

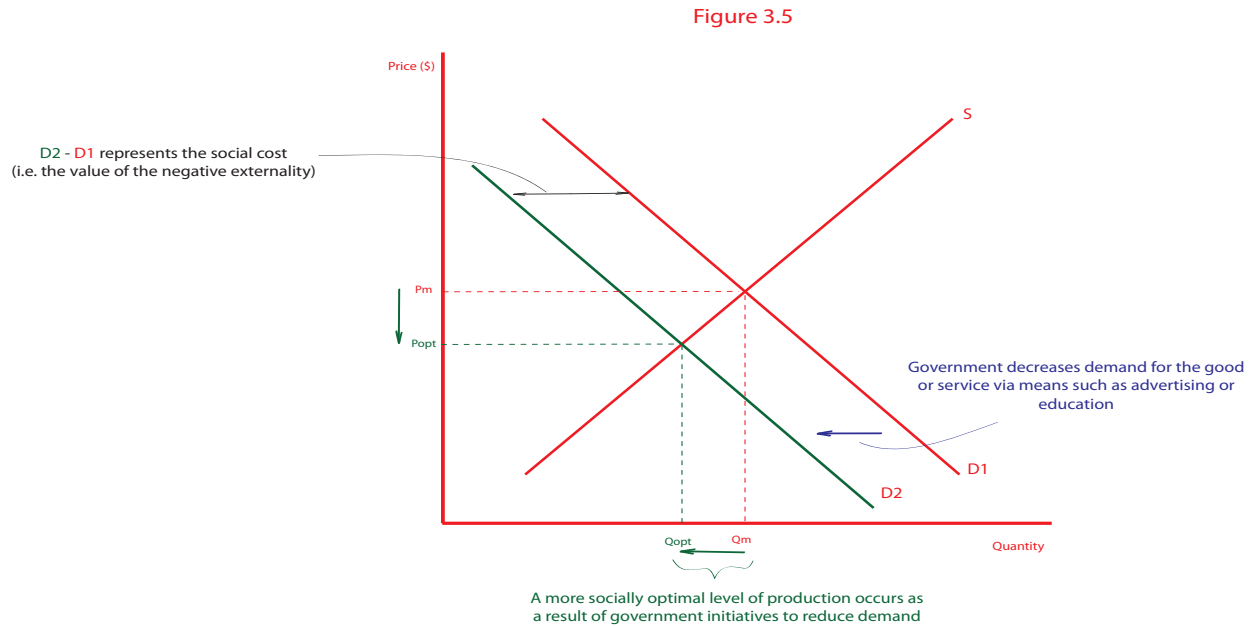
Governments have also tried to reduce the incidence of negative externalities by influencing **tastes and preferences**. To do this they engage in advertising campaigns that attempt to educate the public about the costs that are being



imposed on both the individual and society. This also applies to **demerit goods**. These types of goods and services tend to be over consumed because the consumer is unaware of or indifferent about the consequences associated with consumption (such as the health problems caused by excessive drinking, smoking and gambling).

Each form of educational advertising is designed to shift the demand curve for the product to the left. In doing so, a surplus would be created at the existing price. The decrease in demand reduces the profitability associated with producing the good or service in question and suppliers look elsewhere to maximise their profits. Theoretically, the greater knowledge provided to the consumer assists them in making more informed choices; choices that are more likely to maximise his or her long-term wellbeing. In making these choices, they also reduce the negative externalities associated with consumption.

The reduction in demand is reflected in Figure 3.5, which shows how the equilibrium quantity traded decreases from Q_m to Q_{opt} .



Below are two examples of government advertising campaigns that have been designed to reduce consumption and production of goods and services that cause negative externalities.

- Ongoing QUIT campaigns aimed at reducing cigarette consumption. These campaigns have illustrated, in an extremely graphic form, the health consequences associated with smoking and how smoking can affect children and those yet to be born. (The very effective 'Every cigarette is doing you damage' advertising campaign can be viewed at <https://www.youtube.com/watch?v=rjOZSg39bb0>).
- The government ran a campaign to illustrate the climate change consequences associated with electricity consumption by using black balloons. This video can be viewed at <https://www.youtube.com/watch?v=v12F0PqSWKw>.
- In 2018, governments of Australia cooperated on a campaign to reduce the incidence of domestic violence, especially against women. The aim of the campaign was to prevent behaviours that impose significant costs on society and to attempt to change behaviours over future generations.

Review Questions 3.2c

1. Explain the difference between a positive externality in production and a positive externality in consumption.
2. Identify one example of a positive externality in production and explain, by referring to the difference between private and social costs, why the market would tend to under allocate resources towards the production of this good.
3. Identify one example of a positive externality in consumption and explain, by referring to private and social benefits, why consumers may consume a sub-optimal level of this good or service in a free market.
4. Identify two different types of government intervention that have been implemented, or could be implemented, to increase the production and consumption of a good or service that conveys external benefits.
5. With reference to your examples in question 4, draw two demand and supply diagrams to illustrate how the equilibrium price and quantity might change.
6. Identify one example of a negative externality in production and explain, with reference to social and private costs, why the market would tend to over allocate resources towards the production of this good.
7. Identify one example of a negative externality in consumption and explain, with reference to social and private benefits, why consumers may consume a sub-optimal level of this good or service in a free market.
8. Identify two different types of government intervention that have been implemented, or could be implemented, to reduce the production and consumption of a good or service that imposes external costs on third parties.
9. Use two different demand and supply diagrams to illustrate how the two policy initiatives discussed in question 8 might work to change the allocation of resources.
10. With reference to at least one type of efficiency, explain how actions to correct the market failures caused by negative externalities are likely to lead to a more efficient allocation of the nation's scarce resources.

Activity 3e: The private and social benefits associated with education

Education is expensive. In a free market, many people would be unwilling and unable to pay for the total cost of being educated. There are significant private benefits associated with purchasing education such as higher average incomes over one's lifetime and an increased ability to self-actualise (achieve one's human potential). In a free market with minimal government intervention in the market for education, many people would not be able to achieve their human potential and society would be significantly worse off.

Consider the following external benefits associated with education:

- Education will help to reduce the unemployment rate. In an era of rapid changes in technology and increased international competitiveness, it is important to maintain and increase educational standards. Educated workers will be able to generate benefits for firms (who don't have to pay for the applicant's education) by filling skills shortages and helping the business to expand. The lower unemployment rate also provides benefits to society because the government will not need to spend as much on unemployment benefits and will generate more revenue that can be used for the building of infrastructure and the provision of public goods.
- Education develops the skill levels of future employees and entrepreneurs such that productivity growth might occur in the future. Educated people may have been taught how to solve complex problems using critical and creative thinking tools. This could lead to more efficient workplace practices and better use of existing technology. Some of the educated people may also be well suited to research and development initiatives that will result in the development of new technologies and better production techniques.
- An educated society will also be more likely to vote for politicians who are also well educated. This leads to better governance and an expectation that policy initiatives are subject to lengthy and intelligent debate.
- A more educated society may be associated with increased social cohesion. Crime rates might be lower, and tolerance of differences might be more prevalent.
- A more educated society will have a deeper understanding of the relationship between the economy and the environment. Educated people are more likely to vote for and lobby governments for changes in environmental policy that promote sustainability.
- Educated people may have greater awareness of the long-term consequences associated with the consumption of demerit goods. For example, they may be less likely to smoke, which means that future societies will benefit from having a healthier workforce and less money will need to be spent on preventable illnesses.



In Australia, education is heavily subsidised. The government provides both primary and secondary education at the lowest possible cost. This means that the supply curve shifts to the right by a large amount and the quantity traded is much larger (a large expansion along the demand curve). The government also tries to ensure that all students attend school until they are at least 16. It is effectively mandatory, so this is a form of 'interventionist' policy that makes it much more difficult not to consume the product. Tertiary education was free in Australia between 1973 and 1989, after which point the government introduced the HECS scheme (which recognises the increasing cost to the government and the fact that the educated person obtains private benefits). The Higher Education Contribution Scheme (renamed later as the HEC-HELP scheme) acts as a loan for the student, making it easier to participate in tertiary education when compared to an alternative such as upfront payment.

Questions

1. Distinguish between a private and a social benefit.
2. Explain why an educated person will receive private benefits.
3. Consider the list of positive externalities associated with education. With reference to one of these examples, explain why the free market would tend to under allocate resources to the production and consumption of education services.
4. Explain how the government intervenes in the market for education to correct the market failure associated with positive externalities.

3.2 (iii) Asymmetric information

When demand and supply analysis is undertaken, one of the key assumptions made about the perfect market is that economic agents have access to **perfect information**. This important assumption refers to the fact that a rational consumer or producer will have knowledge of the full costs and benefits of the product or factor they are purchasing, they are aware of the prices of all products in the market, the resources used and how the product or factor was produced. If a consumer or business has access to all of this information, then they are more likely to make a purchasing decision that maximises their wellbeing and thereby moves towards increasing society's collective satisfaction.

In the real world, it is likely that some of the information needed to make a decision is not available. Acquiring information in many instances is costly, both for consumers and producers. In certain circumstances, consumers will not be able to ascertain all information about the good or service they are purchasing. In some circumstances, the seller of a service will not have enough information about the purchaser to be able to charge the correct price or offer the right service. **Asymmetric information** refers to a market transaction where one party has access to more information than the other. This can alter the behaviour of the buyer and/or the seller, can lead to excessive or below 'fair value' prices and will usually lead to an inefficient allocation of resources. Decisions made using unreliable or incorrect information can lead to the need for increased spending later and may create excessive waste in a society. Society's wellbeing could therefore be improved through greater access to meaningful information and/or government intervention.

Situations where the seller has more information than the buyer

In many transactions, the seller will know more about the quality, reliability and features of a product they are selling than the buyer. In an unregulated market, the seller may make claims about a product that are not true (the buyer may not know this until they consume the product and it doesn't work as advertised) and the seller may also hide any defects that they are aware of. Even if information is made available, the seller may have a better understanding of the product and may be able to persuade the consumer to purchase the product, even if it is not in their best interests.

Examples of asymmetric information where the seller has the power

George Akerlof undertook one of the first influential economic studies of asymmetric information. He wrote a paper on the market for **'lemons'**. A lemon is colloquial language used to describe a car that has defects. When a used car is offered for sale, the seller usually has more information about the condition or quality of the car than the potential buyer. It may be expensive for the consumer to ascertain the necessary information to make an informed choice and, as a consequence, they will be uncertain about the quality of

the car. Some consumers, who may have read about or experienced bad service in the past, may assume that the car is a lemon, when in fact it might be a high quality car, and offered at a price that is below its market value. The consumer who is aware of the possible dangers associated with buying a used car may be more risk averse and avoid buying a second hand car altogether. This means that the seller of the used car will not be able to sell the car for what it is really worth and might decide to take the car off the market. A mutually beneficial transaction doesn't take place and the information asymmetry results in **adverse selection** (an economic outcome that does not maximise wellbeing for at least one of the parties). The sale of the car for a fair price could have been a transaction that boosted efficiency because it would have made both parties better off. This means that fewer second-hand cars may be sold in the market and may lead to an over allocation of resources to the production of new cars. This does not necessarily maximise society's wellbeing as those resources could have been used more effectively elsewhere (especially if you consider the environmental costs of producing so many new cars) and a greater volume of waste is generated in society (reducing inter-temporal efficiency).



In a number of **service industries** the service provider may know more about the level of service required than the consumer. A person who visits the dentist will usually be unaware about the state of their teeth. The dentist is a trained expert and will inform the customer of what treatments are needed. In a situation like this, the dentist could lie and suggest that the patient needs an expensive treatment when it may not be necessary. In this situation, there will be an over allocation of resources to the production of unnecessary treatments. The consumers may be paying for something they didn't need and this adds little to their living standards and reduces their ability to access other goods and services.

In the market for vitamins and herbal supplements, there is the potential for the suppliers to make misleading claims about the efficacy of their products. For example, a company may claim that their product ‘suppresses appetite’ and promotes ‘weight loss’. They may also claim that this is backed by ‘scientific studies’. The consumer whose living standards may be boosted from consuming such a product may be happy to exchange their income for the product. If the claims are misleading and deceptive, however, then there will be an inefficient allocation of resources. Too many resources may be allocated towards the production of a good that results in very few health benefits. Furthermore, it could, also lead to an under allocation of resources to other goods and services that could potentially help people because the consumers become more wary of health claims made by manufacturers (even if they have proven them to be true).

Many people have pets and obviously care about their wellbeing. A series of recent investigations in Australia and in other developed nations, has found shocking evidence of inappropriate ingredients being added to pet food. This is considered in Activity 3f.

Asymmetric information can also occur in factor markets. In factor markets, the producer is buying from sellers of land, labour and capital. In an employment contract, those offering their labour services for payment will generally know more about their capabilities than the employer. The buyer of labour services can use a number of measures to improve their knowledge about the worker, but the quality of the worker often does not become apparent until the employment contract begins. There is potential for the employer to hire someone who is lacking the necessary skills, who is unproductive or who has a negative effect on the workplace culture. The information asymmetry can also lead to the problem of moral hazard, which is discussed below.



Situations where the buyer has more information than the seller

In some market transactions, the buyer will have a greater amount of information available than the seller. This usually arises in situations when the consumer knows something about him or herself that affects the price charged or the viability of a transaction. Consider the following illustrative example:

Example of asymmetric information where the buyer has the power

The market for **insurance** is a situation where the buyer usually has more knowledge about their probability of making a claim than the seller (who takes on a risk by insuring someone). A consumer purchasing health or life insurance knows whether they smoke and/or have a healthy lifestyle. The long-term consequence of the person who buys health insurance engaging in unhealthy behaviours is that the average premium for all those who purchase health insurance increases (even those who look after themselves). The low risk consumers effectively subsidise the high-risk consumers. The low risk consumers may undertake a cost/benefit analysis (based on the available information) and conclude that the insurance is not worth the price charged. As more ‘healthy’ people drop out of the market, the average costs for the insurance company increase, leading to higher premiums (and more people being unwilling or unable to afford it). As was the case with the used car market, there may be a serious under allocation of resources to the private health insurance market due to asymmetric information.

Asymmetric information, moral hazard and inefficiency

Moral hazard occurs when economic agents adjust their behaviours to one that is less efficient or favourable from society’s point of view. It typically occurs in insurance, where economic agents are somewhat insured against the risk of loss and then become less risk averse in their actions because losses incurred are transferred to the other party (e.g. the insurer). Those who take out car insurance may take less preventative measures to reduce the theft of their vehicle because they know that they will be reimbursed in the case of loss. Those who purchase health insurance (which includes extras) may purchase more services than are necessary for them to maintain good health. For each of these examples, there may be an inefficient allocation of resources. There will be an over allocation of resources to the repair or replacement of vehicles, which could have been avoided if the driver/owner of the car had been more careful.

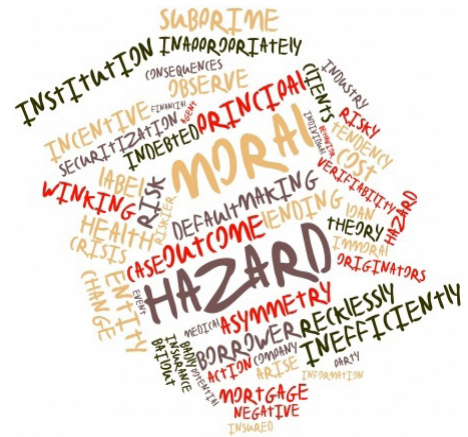
Moral hazard reflects the fact that people may change their behaviour once a transaction has already taken place. Once a worker is hired and they know that their job is relatively secure, then he or she may have the incentive to alter his or

her behaviour. This could be more prevalent if the worker’s behaviour or output cannot be continually monitored. He or she may choose to ‘slack off’ occasionally. This means that the worker may reduce their potential productivity and technical efficiency will be compromised. As a result, society’s wellbeing is not maximised and market failure occurs.

Market responses to asymmetric information

In many markets, the uninformed party may take action to gain the necessary information to make an informed decision. Potential employees have the incentive to promote themselves (and possibly lie) during an interview in order to gain a position. An applicant may therefore want to engage in **signalling** to communicate information that the other party (the employer) would find valuable. The applicant may rely on their previous experience, place of education (qualifications) and referees as an observable indicator of some unobservable characteristic. In some cases, the applicant may also have a website or portfolio of work that they can show to their potential employer.

From the employer’s perspective, the way to obtain the best employees may involve an effective **screening** process. The initial screening may involve checking resumes for simple errors, which would convey information about their attention to detail. Firms may also undertake psychological tests and trial periods to screen applicants. Some employers have gone so far as to monitor the behaviour of their employees. There have also been well-documented cases of parents using hidden cameras to observe the behaviour of their child’s babysitter. It could also be argued that the increased incidence of performance-based pay is a step towards reducing moral hazard. Those who can show productivity improvements will be rewarded accordingly, and profit sharing arrangements may also discourage ‘slacking off’ or ‘shirking’ on the job.



Private organisations and associations may also provide useful information for potential consumers. **Independent reviews** by consumer groups such as Choice, and an RACV car inspection can help the consumer to increase their level of information about a particular good or service. When people are looking to purchase a second-hand car, they may wish to take the vehicle to a trusted mechanic who is able to increase the amount of information the buyer has before making a decision. The **Internet** has also provided consumers with a wealth of information to ascertain whether the product offered by suppliers meets their needs and is priced competitively. There are a range of web sites that makes comparisons between products based on price, features, reliability and after-sales service. It has been argued that consumers have more information available to them than at any point in history.

Firms in the insurance industry have also sought to reduce the incidence of **moral hazard** by altering the nature of their contracts. Purchasers of insurance are expected to provide a great deal of information that gives the insurer greater insight into their risk profile. The insurance companies also offer buyers flexibility with regards to the excess. This is the amount that the purchaser of the insurance must pay ‘out of pocket’ in the event of an insurance claim. Buyers of car insurance, for example, who choose to pay a large excess in the event of an accident, signal to the insurance company that they are a lower risk and will generally be offered a lower premium. This is because they are indicating they are less likely to make a claim, because to do so would impose a higher economic penalty on them if they agree to pay a higher excess. Because a higher excess shifts some of the cost of a claim to the buyer, it alters their incentives with regards to risky (sub-optimal) behaviour.

Each of these above measures does not require government intervention as the market has evolved to deal with the problems associated with the relevant information asymmetries.

Government intervention: Asymmetric information

As this section has illustrated, a lack of meaningful information can lead to adverse selection. This results in an allocation of resources that is not optimal from society’s perspective. A lack of information can result in the excess allocation of resources to some areas of production, an increase in the suspiciousness of consumers that has a dampening effect on mutually beneficial trades, and when behaviour cannot be monitored, moral hazard can occur. The Government can intervene in markets to reduce the incidence of **market failure** that is associated with asymmetric information.

Government regulation

Governments can protect consumers from **misinformation** that might be provided by sellers. Australian **Consumer Law** makes it illegal for firms to engage in conduct that misleads or deceives consumers or other businesses. This area of legislation also covers unfair contract terms, consumer rights including warranties, safety of purchased products

and rules for door-to-door selling and direct marketing. There is an inherent right given to consumers with regards to the purchase of a product. If there is a 'major problem' with a product or service, the consumer has the right to ask for a choice of a replacement or a refund. In the case of a 'major problem' with a service the consumer can choose to receive compensation for the drop in value below the price paid or a refund. This legislative approach provides incentives for firms to alter their behaviour and may provide the consumer with more confidence to engage in mutually beneficial transactions. In the end, the consumer is more likely to 'get what they pay for' which boosts living standards and results in a more efficient allocation of resources. While it might not reduce asymmetric information, it deals with its consequences in the event of it causing an inefficient allocation of resources.

In some circumstances, the government will introduce regulations that ensure that the seller of a product provides a greater level of meaningful information to the consumer. For example, food-labelling laws in Australia require processed food manufacturers to list the ingredients used in descending order (by ingoing weight). Most packaged foods are also required to show the key or characterising ingredient. For example, almond milk suppliers would need to show the percentage of almonds used to make the product (this is between 2% and 10%). The packaging also displays nutritional information with the amount of energy, protein, fats, carbohydrates, sodium and fibre being shown per 100 millilitres or 100 grams. Forcing the supplier to provide this type of information for the consumer helps to improve living standards and results in a more efficient allocation of resources. Those with allergies, for example, are less likely to need unavoidable medical treatments and people are able to make healthier choices that lead to more enjoyment from life. Notice how the provision of this information also helps to not only reduce asymmetric information, but also helps to boost the consumption and production of goods that provide positive externalities.

In the **health insurance market**, government has used its legislative powers to intervene extensively. Those who earn more than \$90,000 per annum (\$180,000 for families) will face a Medicare Levy surcharge if they do not have health insurance (between 1% to 1.5% extra tax payable). The government also imposes an additional cost on those who choose to begin purchasing health insurance after they are 30. For each year that a person does not have health insurance above this age, they need to pay an extra 2%. This means that if a person joins a private health fund when they are 40, they would pay 20% more than the stated premium each year. The government also provides a subsidy for those who choose to take out private health insurance. The amount of the subsidy is based on individual or household income (the highest rebate available is 25.4% for individuals earning less than \$90,000 (\$180,000 for households) and cuts out when income reaches \$140,000.) These measures are obviously designed to alter incentives because they make it more expensive to avoid or delay the purchase of health insurance (especially for those who have been deemed by the government to be able to afford it) as well as making private health insurance more affordable for low and middle income families. The change in behaviour that eventuates may increase allocative efficiency because the government may not have to spend as much on the provision of public healthcare, which can reduce waiting lists in public hospitals and encourages more people to seek out and receive the treatment they may need.



The government can also require that people who operate in certain industries are certified and registered. For example, doctors, lawyers, teachers and other professionals have to pay an annual fee and undergo on-going professional development to maintain their registration. This reduces the likelihood of a consumer buying a service from someone who is a fraud or who has caused harm to a previous purchaser.

Government advertising

As was discussed in the section on positive externalities, consumers may be unaware of both the private and external benefits associated with **merit goods** (products that enhance consumer outcomes) and the private and external costs associated with demerit goods (usually harmful to the consumer in some way as well as others in society). Merit goods tend to be underprovided in a free market and demerit goods may be overprovided. This can, in part, be caused by a lack of information about the consequences of not consuming merit goods and/or excessively consuming demerit goods.

- The government could run information campaigns that highlight the benefits associated with purchasing fresh food and vegetables
- The government could inform the public about what smoking, drinking and excessive consumption of the wrong types of foods could do to their health.

The provision of information, if effective, should lead to a reallocation of resources, such that society's wellbeing is improved. Advertising campaigns of this nature were discussed in section 3.2(ii).

Subsidies

To increase the availability of information, the government could also subsidise firms who provide meaningful information for consumers. Documentary makers, who highlight the health consequences associated with the consumption of merit and demerit goods may be able to receive grants from the government, which increases the likelihood that potential consumers have access to meaningful information. This subsidisation indirectly alters incentives and behaviour such that a more efficient allocation of resources is achieved.

Activity 3f: What is in pet food?

Approximately two-thirds of Australian households share their home with a pet. Each year they spend approximately \$2 billion a year on processed pet food. Recent investigations, including a feature length documentary on Netflix (called *Pet Fooled*) have highlighted the high level of asymmetric information that may be present in this lucrative industry. Many manufacturers go to great lengths to advertise their products as natural and nutritious, with many consumers being unaware of what the full list of ingredients actually means. There is a growing body of evidence that suggests that some of the ingredients included in the processed food are contributing to avoidable health problems for our pets.



At the time of writing, there was 'no provision on requiring manufacturers to state actual ingredients or methods of processing'. Many pet food companies do list the ingredients on their pet food but it is likely that most people (assuming they chose to read the list) would probably lack the education to know what many of the ingredients are. For example, many commercially produced pet foods include ingredients such as gelling agents, tocopherols and yucca root as well as a number of synthetic vitamins and artificial colours. One of the gelling agents used in many pet foods is carrageenan, which is made from seaweed. The safety of this additive is increasingly coming into question. In 2013, the Cornucopia Institute reported that 'food-grade carrageenan causes gastrointestinal inflammation and higher rates of intestinal lesions, ulcerations, and even malignant tumors.'

To increase the awareness of the product that is being purchased, consumers can seek clarification from the producer themselves, but this is no guarantee that the information asymmetry will be resolved. For example, a recent consumer concern about whether carrageenan was an ingredient in the gelling agent was met with the following reply from a pet food manufacturer: 'Unfortunately we are unable to provide the specific gelling agents we use within our petfood as this is part of our confidential recipe, however it is plant based and safe for consumption'. Not surprisingly, the consumer decided to stop purchasing the product.

In a recent report on ABC's 7.30 program (link below), an ex-abattoir worker admitted that the offal (sourced from butchers) often contained foreign materials, such as plastic ear tags that were melted in the cooking process and ended up in the pets' foods. The pet food producers, such as Nestlé, who produce brands including Purina and Lucky Dog, received 295 complaints about foreign materials such as plastic and metal in their products.

It is evident from these examples, that lack of information about what is in pet food and what is the best type of nutrition for our pets can contribute to lower than anticipated levels of collective satisfaction. Consumers might then decide to avoid the pet food market altogether, which might not be the most efficient outcome. Further, premature death of an animal or avoidable health conditions can significantly reduce both material and non-material living standards of owners (and their pets). Allocating scarce resources to pet medicines and treatments could also be avoided if consumers were able to make more informed choices about their pets' food.

In response to the growing concerns raised by investigative journalists and the public in general, the Australian Government announced in 2018 that it was holding a parliamentary Senate inquiry into the pet food industry. Some of the areas of focus for the inquiry are the labelling and nutritional requirements for pet food, the feasibility of introducing an independent body to regulate standards and an investigation into successful regulation practices that have been employed overseas.

Questions

1. What is meant by the term 'asymmetric information'?
2. Explain why there might be information asymmetry in the market for pet food. Give examples from the case study or your own knowledge of the industry.
3. Explain why the asymmetric information in the pet industry may result in a sub-optimal allocation of the nation's scarce resources.
4. What role do investigative journalists make in addressing the problem of asymmetric information?
5. By the time this book is published the government may have released its recommendations from the Senate Inquiry into 'Regulatory approaches to ensure the safety of pet food'. Summarise the recommendations of the inquiry and discuss how they may address the problem of asymmetric information and correct the market failure in this industry.

Additional resources: <http://www.abc.net.au/news/2018-06-19/pet-food-insider-lifts-lid-on-plastic-and-rubbish-going-into-pe/9875184>; https://www.aph.gov.au/Parliamentary_Business/Committees/Senate/Rural_and_Regional_Affairs_and_Transport/SafetyofPetFood; <http://www.truthaboutpetfood.com>

Activity 3g: Sugar and tobacco – negative externalities and asymmetric information

In recent times, media outlets have drawn some interesting parallels between the harm caused by sugar and tobacco. The negative health effects of cigarette smoking are well documented, with countless studies showing that it increases the risks of contracting cancers, heart disease and a myriad other health problems. Cigarettes are also associated with negative externalities, because those who smoke near other people impose a cost on them. The recipients of the second-hand smoke may suffer a reduction in their living standards (which could be simply a loss of enjoyment of their life or, over extended periods, could lead to the same sorts of health problems experienced by the smokers themselves). The smoking of cigarettes also places an avoidable burden on the healthcare system in the future. The government will need to allocate a greater share of its tax revenue to the treatment of those whose illness can be directly linked to cigarettes. This might require increased taxes for future generations; increased interest payments because the government has to borrow more; or an opportunity cost in that other government services that provide positive externalities may not be affordable.



In the current era, most people are aware of the dangers associated with cigarette smoking but at the height of their popularity, there was definitely a high degree of asymmetric information. This became most evident in 1994 when a tobacco researcher at the University of California gained access to a 4,000-page report, prepared on behalf of the tobacco companies. The report, known as 'The Cigarette Papers' and prepared in the 1950s, showed that there was a link between smoking and a number of avoidable illnesses. Rather than make the information available to the public, so that fully informed rational decisions could be made, the tobacco industry embarked on a public campaign to suggest that they were unaware of any harm that cigarettes caused and sought to employ 'experts' to cast doubt on any studies that suggested that cigarettes were dangerous. This highlights the degree of asymmetric information that existed for a substantial period of time.

Recent research into the health problems that can be caused by the excess consumption of sugar have allowed reporters to draw some interesting parallels. Some have described sugar as 'the new tobacco'. A number of scientific studies have linked sugar consumption to conditions such as obesity, heart disease, Alzheimer's disease and diabetes. It could be argued therefore, that excess sugar consumption in the current period is likely to impose costs on future generations (inter-temporal inefficiency). Like tobacco, it will cause future health budgets to be devoted towards the treatment of medical conditions that could have been avoided if people consumed more nutritious food. Losing more days to illness will also mean that the nation's potential output could suffer (reduction in future increases in technical efficiency).

Knowledge of sugar's damaging effects has received significant media attention in recent times but for the last 30 years many people may have been consuming excess amounts without knowing the potential dangers. The sugar industry has also been accused of spreading misinformation to protect their profits. Like the 'Tobacco Industry', the 'Sugar Industry' has funded research to show that there is a questionable link between sugar consumption and poor health outcomes. The industry went a step further, however, and sought to demonise fat, linking its consumption to heart disease (a link that has become the subject of much debate). When fat was removed from a number of processed foods, they tasted terrible, so sugar was added to make them palatable. The sugar industry was also able to influence the dietary recommendations advocated by the American government (and adopted in Australia as well), which promoted a low fat, high carbohydrate diet. Some researchers have declared that such a diet (especially when it is associated with a high sugar intake) has been the primary cause of America's (and other nations') obesity epidemics. It could therefore be argued that asymmetric information (caused by a lack of reliable information about the potential harm caused by sugar) may increase the incidence of negative externalities.

Given the potential downsides associated with sugar consumption, some countries (such as France, Mexico and the UK) have sought to implement a 'sugar tax', treating the product in the same way as tobacco. The taxes on these products are imposed because the products are considered demerit goods (because the consumer may not be aware of or care about the potential harm caused by their consumption) and also because their consumption will cause negative externalities. The tax is designed to shift the supply curve to the left, resulting in a higher equilibrium price. This would reduce sales and alter the allocation of resources, increasing the likelihood that the market failure (the over allocation) is reduced. 'The Impact of a Tax on Sugar-Sweetened Beverages on Health and Health Care Costs', a study conducted by Sacks, Antonopoulos and Martin in 2016, concluded that a sugar tax that caused soft drinks to increase by 20% would save 600 lives, prevent 4,400 heart attacks and save the government \$609 million per year in healthcare costs.

Questions

1. Distinguish between a negative externality in production and a negative externality in consumption.
2. Explain why the consumption and production of tobacco might be associated with negative externalities.
3. Identify and explain the negative externalities that might be associated with the consumption of products that contain sugar.
4. With reference to both the sugar and tobacco industries, explain how the respective industries actively tried to create an environment of asymmetric information.
5. Explain how the existence of asymmetric information could have contributed to an inefficient allocation of resources in either the sugar or the tobacco industries.
6. Explain how the imposition of excise taxes alter the allocation of resources and attempt to correct the market failures associated with the consumption of sugar or tobacco products.
7. Draw a fully labelled D/S diagram to illustrate your answer to question 6.

Review Questions 3.2d

1. Discuss what is meant by the term asymmetric information.
2. Explain why having access to information is important for a market to function effectively.
3. With reference to a specific example, explain how the existence of asymmetric information might lead to a reduction in allocative efficiency.
4. With reference to a different example, explain how asymmetric information might contribute to the problem of moral hazard.
5. Explain how moral hazard might occur in the workplace and how this can result in a reduction in technical and allocative efficiency.
6. With reference to two specific examples, explain how the internet has helped the market to become more efficient.
7. Visit <http://consumerlaw.gov.au/>. Outline three elements of the government's legislation that are designed to reduce the inefficiency that is caused by asymmetric information.
8. Identify and explain one other specific government initiative that has addressed the problems caused by asymmetric information and explain how this initiative has altered the market outcomes such that society's wellbeing is improved.

3.2 (iv) Common Access Resources

As was discussed in previous sections, most goods and services can be purchased in markets where the buyer and the seller are each exchanging something of value to them. Most of the goods traded in the market are private goods, which means that due to our protection of **property rights**, someone who owns the good has the right to transfer ownership of the good to someone who is willing to pay for it.

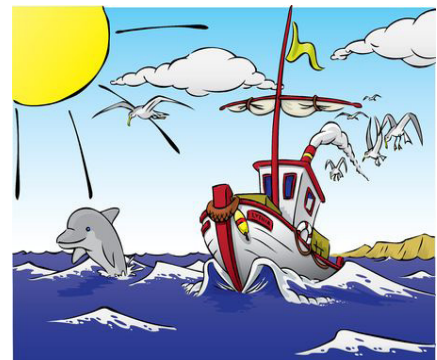
Common access resources do not fit neatly into our discussion of the market because they are, by definition, not owned by anyone, usually **do not have a market price** and are therefore available to anyone even if they have not paid to use them. Common access resources have one similarity and one major difference to public goods:

- Like public goods, common access resources are **non-excludable**. This means that anyone can utilise these resources without having to pay for them in a market.
- Unlike public goods (and therefore being more similar to private goods), common access resources are **rivalrous** in consumption. Consumption by one individual reduces the amount that is available for someone else.

Examples of common access resources

The **fish in the ocean** (or a river) may be considered a common access resource. If the fishing industry removes more fish from the ocean than the rate of reproduction, then the delicate marine ecosystem can be disrupted and the fishing stock can be depleted (to the point where it does not return).

Clean air could also be classified as a common access resource. Humans use the atmosphere as a dumping ground for all manner of toxic pollutants. Each time a person or business releases pollutants into the atmosphere, the availability of clean, breathable air is reduced for all users.



In some countries, access to **forests** is granted for the use of agriculture and the conversion of trees into saleable timber. In the long term, land may be destroyed by overgrazing (it becomes less arable and soil erosion occurs) and biodiversity may be permanently lost. Future generations experience a reduction in the amount of arable land that is available for them to grow food

Common access resources cause market failure

Each of the above examples highlights that the unsustainable use of common access resources causes environmental problems. **Sustainable development** is an important consideration for all economies because it relates to the balance between current and future consumption. The commonly quoted definition of sustainable development comes from the Brundtland Report:

development that meets the needs of the present without compromising the ability of future generations to meet their own needs

The overuse and exploitation of common access resources by current generations reduces the amount that is available for future generations. Therefore, the living standards of future generations could be reduced by current practices and common access resource use. The existence of common access resources highlights the possible conflict that can exist between the pursuit of economic goals and environmental goals. Attempts to boost allocative efficiency in the current period, by increasing production of goods and services at a lower price, can cause there to be a decrease in inter-temporal efficiency. For example, new technology that is invented that allows fishing crews to extract more fish from the water per hour can actually lead to falls in prices for the fish sold and greater purchasing power for the current generations. However, adoption of these fishing techniques depletes stocks much faster, and therefore reduce the living standards of future generations.

Study tip

Market failure can be discussed in terms of any of the four types of efficiency. In the case of common access resources, it is best to illustrate how the characteristics of common access resources lead to inter-temporal inefficiency because current generations increase their living standards at the expense of future generations.

The problem with common access resources was first described by Garrett Hardin in the journal *Science* in 1968 as the 'tragedy of the commons.' Each person, acting in their own self-interest, pursues actions that maximise their own utility or profit, but this leads to the destruction of the common access resource that is often life-sustaining. He described this as 'freedom in a commons brings ruin to all'.

The **lack of excludability** and the **absence of prices** naturally leads to excessive production and consumption of goods that use up valuable common access resources. Common access resources also share some of the market failure characteristics of negative externalities. Given that clean air is a common access resource, the quality of this air can be reduced through activities that cause toxic pollution. The negative externality is the cost imposed on a third party, which in this case, is all future users of the common access resource who have less clean air available to them. Therefore the intertemporal efficiency achieved in the free market is reduced by the overconsumption of common access resources.

The link between negative externalities and common access resources is discussed in Activity 3h which looks at the use of microbeads in many beauty products.

Government intervention: Common access resources

Government regulations

Governments can use their legislative powers to reduce the current consumption of common access resources and thereby help to promote sustainable development. The government can implement legislation that bans the use of certain common access resources, requires alterations to production techniques, requires users to apply for permits or licenses or change the law with regards to the setting and monitoring of quotas.

Consider the following examples of government regulations:

- Requirements that cars be fitted with catalytic converters. This was discussed in the section on negative externalities but is also relevant here because excess **pollution** reduces the amount of clean air (a common access resources) that is available, because the driver uses the atmosphere as a receptacle for their waste.
- Banning the use of certain substances. For example, CFCs have been banned since the late 80s as they created a hole in the ozone layer. The ozone layer is a common access resource because it provides protection to all from harmful UV rays.
- The government may restrict when people can undertake hunting activities. For example, in Victoria, ducks can only be hunted between predetermined dates, usually between March and June each year. Hunters also have limits on the amount of ducks they may kill each day. Certain species of duck are also banned from hunting, depending on their populations.
- Certain areas of land are excluded from **excessive development**. For example, Parks Victoria (a government authority) is responsible for the protection and enhancement of over four million hectares of important land. This land is utilised in a sustainable fashion so that future generations can utilise the resource in the same way that current generations are able to do so.
- The government may ban certain production techniques. The Victorian Government recently implemented a ban on commercial net fishing in Port Phillip and Corio bays.



Each of these legislative initiatives is designed to reduce current consumption or destruction of common access resources and is therefore seen as a way to boost inter-temporal efficiency. In doing so, market failure may be reduced.

Indirect taxation

Indirect taxes were discussed in section 3.4 as a possible way for the government to correct the market failure associated with negative externalities. Indirect taxes are designed to alter the structure of relative prices in relevant markets and this alters incentives for producers and consumers and therefore promotes behaviour that may achieve more sustainable outcomes. Certain types of pollution are associated with a reduction in the quality of common access resources such as clean air and water. The government can introduce taxes that are designed to reduce the use of common access resources. The most effective way to understand how these taxes work is to consider one of the most important challenges faced by society in terms of sustainability- climate change.

It could be argued that a stable climate is one of the most important common access resources that people have available to them. Approximately 99% of scientists attest to the fact that human action, especially the burning of fossil fuels which release carbon dioxide into the atmosphere, is a significant cause of climate instability and the warming of the planet. This may reduce the ability of future generations to access the favourable weather conditions needed to maintain the currently-enjoyed high standards of living. Government-commissioned reports from around the world (including the Garnaut report in Australia and the Stern report from the UK) have predicted some of the potential costs that might be imposed on future generations as a result of **climate change**. These include:

- Increased damage to homes, businesses, infrastructure and common access resources from unstable weather patterns. Typhoons, hurricanes and cyclones that cause this damage are predicted to be more prevalent and more extreme.
- The incidence and intensity of drought may be more pronounced reducing the productive capacity of the farming industry.
- Climate change would destroy one of Australia's most beautiful and income-producing common access resources- the Great Barrier Reef



The most significant attempt by the government to mitigate the effects of climate change and protect future generations from unstable weather patterns was the **carbon tax** (called **carbon pricing**). The carbon tax came into effect on July 1, 2012 and was effectively removed from 1 July 2014. It was initially set at \$23 per tonne and therefore added to the costs of production for those top 500 polluting firms who were affected (it obviously also had an indirect effect on other energy-intensive businesses and consumers). The tax increased the cost of production for firms using fossil fuels and provided the incentives for firms to alter their methods of production. Households also had the incentive to change their behaviour to avoid paying for the higher electricity costs. In fact, this was the main way the tax impacted on households. A study completed by the Australian National University concluded that the carbon pricing resulted in a cut in carbon emissions by as much as 17 million tonnes. This policy initiative therefore reduced damage to the atmosphere (a common access resource) and may have helped to mitigate the damage associated with climate change. The efficiency of resource allocation was improved in the following ways:

- The carbon tax **internalised** some of the **negative externalities** that are associated with burning fossil fuels. The supply curve for products such as electricity decreased, resulting in a higher price and a contraction along the demand curve. Therefore, the over allocation of resources towards coal-fired electricity was partially reduced and the common access resource of the atmosphere was used in a more sustainable manner. The movement along the demand curve is linked to the change in behaviour of both firms and end consumers such as households.
- The carbon tax provided a new incentive for firms to look at 'how' they produced goods and services. With the introduction of a carbon tax they may have investigated **alternative production techniques** and installed solar panels, which, in the long term, resulted in productivity gains and lower marginal costs.
- Households, faced with higher electricity prices, also had the incentive to change their behaviour over time. Solar panels became more viable and measures may have been taken to reduce consumption such as simply switching off lights when not in use, lowering the temperature on heaters in winter and installing energy efficient globes

- The carbon tax resulted in **lower pollution** levels so the air and the atmosphere, a common access resource, was preserved for future generations. The tax helped, therefore, to promote inter-temporal efficiency, because future generations were more likely to experience more stable weather patterns and cleaner air. With more stable weather patterns, a greater level of collective satisfaction can be achieved in the future.

Subsidies

Subsidies can also be implemented by the government to alter incentives and this may lead to the development of 'clean' technologies that do less harm to the environment. Under the Federal Government's **Renewable Energy Target (RET)** scheme, the government actively subsidises research and development and the implementation of renewable technologies such as wind, solar and geo-thermal energy. Like the indirect taxes, this subsidy alters the structure of relative prices and encourages firms and households to change their buying decisions. By supporting the innovation process and helping with the costs of implementation, the government is actively promoting action that will help to mitigate the effects of climate change and promote inter-temporal efficiency.

Surprisingly, some industries, such as coal, that are damaging to the environment are effectively subsidised in Australia. Removal of these subsidies would actually help to alter relative prices and lead to a more efficient allocation of resources. These subsidies are discussed in section 3.3.

The problem with market failure caused by overuse of common access resources is that it often spreads beyond national borders. Climate change is a key example, as stable weather patterns are a common access resource that can be affected by actions taken in other parts of the world. To effectively mitigate the effects of climate change, international cooperation is needed. The Kyoto Protocol was one attempt to reach international agreement on carbon dioxide emissions, but it was relatively ineffective. The European Union also introduced a cap-and-trade scheme, where permits were required for each tonne of carbon dioxide released into the atmosphere. These permits were traded in a market, thereby having a similar influence on cost structures as the abovementioned carbon tax.

Activity 3h - Microbeads – causing negative externalities and ruining common access resources

Many healthcare products sold in Australia contain microscopic pieces of plastic, called 'microbeads'. They can be found in exfoliants, shampoos and toothpaste and most of them end up being washed down the drain. This means that many get through the sewerage treatment plants and end up in our lakes, oceans and rivers.

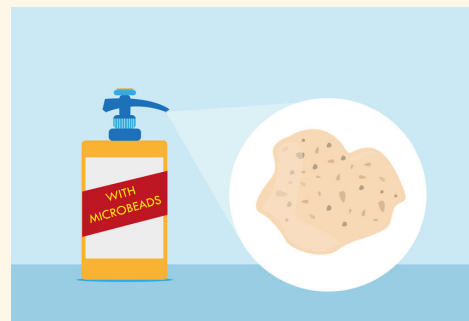
Microbeads that have already been released into the waterways are eaten by marine creatures. Greenpeace describes microbeads and microplastics as a 'toxic timebomb'. These plastics release and absorb toxins and will ultimately move up the food chain, being increasingly consumed by humans. Cosmetics companies once promoted the inclusion of microbeads in their products, but with increasing knowledge of the damage caused by microbeads, more are trying to hide their inclusion by using words such as polypropylene in their ingredient list.

Microplastics have been found in virtually all bodies of water on the planet and on agricultural land. This illustrates how human production and consumption activities have effectively reduced the viability of a very important common access resource and imposed costs on third parties (both now and in the future). It is clear that most humans now ingest plastic products indirectly. Over the past two decades, concern over the effect of microplastics on human health has grown. Some researchers have hypothesised that consumption of these plastics could contribute to hormone imbalance, damaged liver function and increase the probability of contracting certain types of cancers.

Many countries have intervened in the market for microbeads. A number of countries effectively banned the production and sale of 'rinse-off' cosmetic products that contain microbeads. The United States of America, Britain and Canada had all banned their use by the middle of 2018. At the time of writing, Australia did not have a ban in place, but many manufacturers (over 80%) had voluntarily agreed to remove microbeads. This case study also highlights the need for international cooperation as microbeads and microplastics enter the oceans, which affects inhabitants of any country in the world.

Questions

1. Explain why the use of microbeads may cause negative externalities. With reference to the case study and your own knowledge, identify some specific costs that might be imposed on a third party.
2. Explain how the disposal of microbeads affects the use of a common access resource.
3. Explain how the market failure associated with microbeads could be linked to the concept of asymmetric information.
4. Explain how the government could intervene to alter the allocation of resources in this market.



Review Question 3.2e

1. Explain how a common access resource is different from an alternative factor of production used by a business.
2. With reference to the concepts of excludability and rivalry in consumption, explain the difference between a public good and a common access resource.
3. Explain how the unique characteristics of common access resources cause market failure. Make reference to at least one type of efficiency in your response.
4. Explain one policy that has been or could be implemented within an economy to reduce the over-consumption of common access resources.
5. Explain why the market failure associated with some common access resources may require international cooperation to achieve a socially optimal outcome. What makes this difficult to achieve?

3.3 Government failure

The focus for most of this chapter has been on particular cases where the market fails to allocate resources in the most efficient manner. This has meant that resources have not been allocated in ways that ultimately maximise society's wellbeing, in both the short run and the long run. For each of the instances of market failure discussed, there have been a number of ways the government can intervene to boost efficiency. In some cases, however, government intervention can involve **unintended consequences** and lead to an inefficient allocation of resources. **Government failure** is a term used to describe a situation where government intervention fails to improve the allocation of resources or actually makes the allocation of resources less efficient when compared to the free market outcome.

Government failure can arise in some markets when there was no economic reason for the government to intervene. The government may have distorted the price mechanism unnecessarily to alter the allocation of resources in such a way that it has reduced society's overall level of satisfaction. In other cases, the government's approach to solving a perceived market failure might actually cost more than the benefits that are achieved from taking such action. For example, the bureaucratic process, where layers of government employees need to be consulted, may add to the costs and reduce the ability of governments to respond to market failure in a timely manner. One of the great difficulties facing governments seeking to correct market failures is that the external costs or benefits are hard to measure. Imagine how difficult it would be to calculate the 'true cost' of using fossil fuels as our main energy source (sometimes referred to as a technical difficulty associated with this form of intervention). The government can, at best, estimate the cost to society from carbon pollution and then set a price per tonne for carbon (as experienced in Australia for 2 years until mid-2014). However, there is always the danger that the tax might be set too high or too low and this could lead to a less efficient allocation of resources.

Study tip

The study design requires students to consider one contemporary example of government intervention that unintentionally leads to a decrease in the efficiency of resource allocation. A number of examples are provided for you to consider. Students do not need to read or understand all of them.

Price controls

Governments are often tempted to interfere with the free operation of the market by implementing price controls. This might include a **price ceiling**, where the sellers of the goods or services are banned from raising their prices above a certain level. The aim of such a policy is to make such a product affordable for low-income workers. Unfortunately it tends to create an ongoing shortage in the market because the equilibrium price cannot be achieved (as the price set by the government will be below the equilibrium price).

Similarly, the government might set a **price floor**, where the price offered in the market cannot go below a certain level. The aim of such an initiative would be to protect the incomes of those selling the product (such as farmers, whose incomes can be quite unstable due to the low PED and PES of the products they sell). The setting of a price floor often leads to a significant waste of resources because there will be an on-going surplus - produced by keeping the price artificially high above demand at that price. This surplus needs to be purchased by the government so that the producers have the incentive to keep producing.

US states' Price Gouging Laws

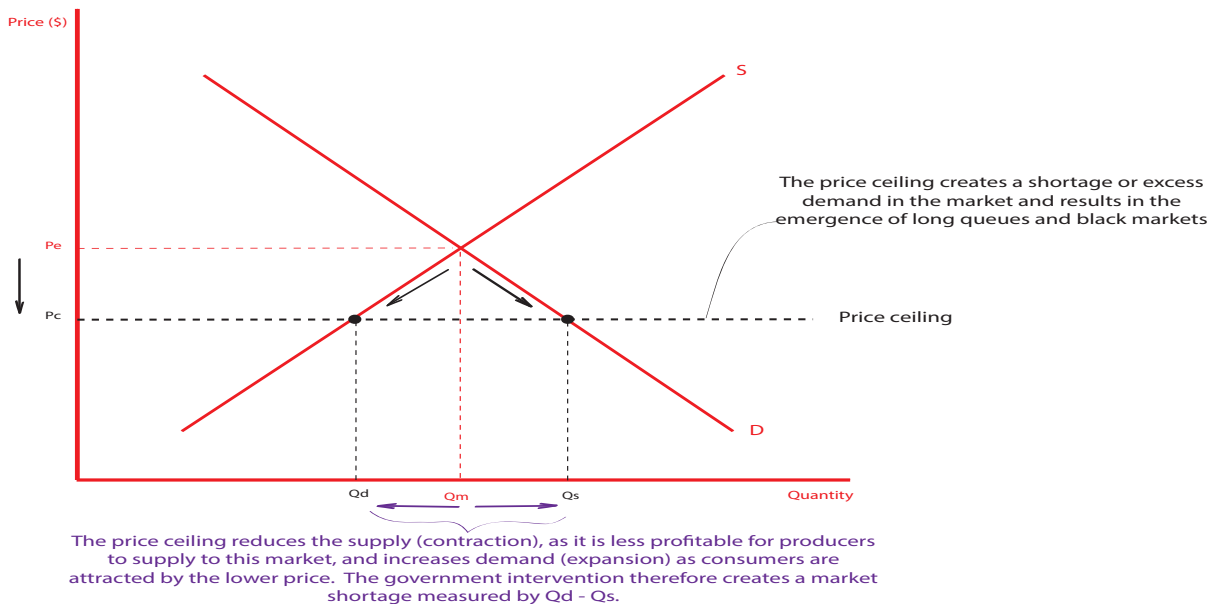
In some states of the US, it is illegal to sell goods at an 'unconscionable price' when a state of emergency is declared. This limits the ability of the free market to respond to the incentives offered by changes in market conditions that cause higher prices. Those found guilty of price gouging face criminal prosecution and fines between \$5,000 and \$15,000 per violation. One enterprising individual during Hurricane Katrina saw that people were without power and decided to purchase 19 generators. He loaded them on a truck and drove approximately 1,000 kilometres to the affected areas where homes were cut off from electricity. He priced the generators at twice what he paid for them. Demand

at that price was greater than supply. The police stopped him from selling his generators, confiscated them and he was charged. The government legislation, in this case reduced the ability of the households to access the goods that they needed and there was a significant underallocation of resources to this market. Whilst commentators at the time described price gougers as 'scabs who prey off the desperate', government intervention to prohibit the behaviour did little to help the people in need and the market failed to adequately respond to the crisis.

When price ceilings are set there is an increased incentive for a black market to develop (where prices might actually be higher than what they would be in a free market because those breaking the law need to be rewarded for the risks they are taking). The black market alters the incentives in the market and suppliers take the risk to supply the potential consumers, even if it means breaking the law. The action by the government has, in effect, led to a reduction in society's wellbeing. The market does not clear and the consumer who can obtain the goods at 'below free market prices' can enjoy an increase in their standard of living. On the other hand, those who are unable to purchase in the 'legal' market must turn to black market sellers where the prices are much higher than what they would be in a free market. The price controls may also mean that some imported goods are not available in supermarkets at all because the government has set a 'fair price' which is below the cost for the supermarket to import the item. This is reflected in Figure 3.6, where the setting of a price ceiling at P_c causes a shortage and a less efficient allocation of resources.



Figure 3.6



Australia: price floors

In Australia, the government imposes a **price floor** in the **labour market**. At the time of writing, the minimum wage was set at \$18.93 per hour for a full time (or part time pro rata) worker who is 21 years old or above. This compares favourably to other countries such as the US where the federal minimum wage has been stuck at 7.25 USD (approx. \$10 AUD) for quite some time and the UK where the minimum wage is £7.83 (approx. \$14.30 AUD). Australia's relatively generous minimum wages have actually fallen in real terms over the last 20 years because the yearly increments in the nominal minimum wage has not always kept pace with inflation.

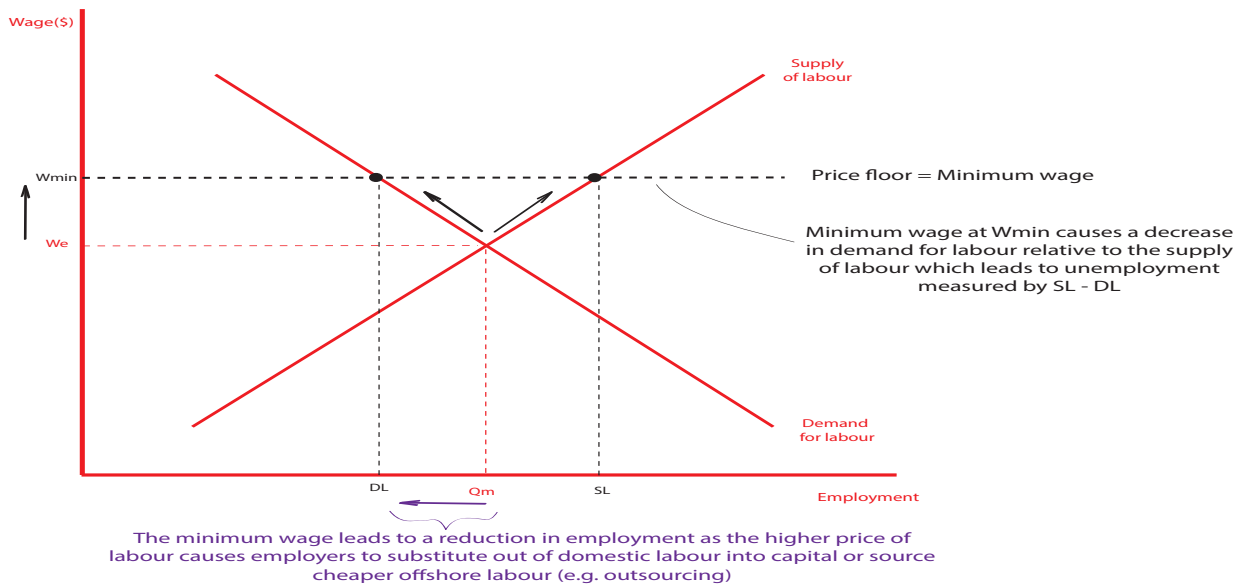
The **minimum wage** is one of a number of policy initiatives that are designed to protect workers with weak bargaining power from excessive exploitation in the workforce. They act as a 'safety net' where those who are engaged in employment can earn enough so that they can live above the poverty line (that is, they can afford to purchase the basic necessities). The difficulties associated with setting the minimum wage is that it is a somewhat inflexible system and does not take account of different economic circumstances that can eventuate in some markets. Some economists and business owners claim the minimum wages set in Australia lead to unintended consequences. The most significant problem associated with setting minimum wages is that the market is unable to achieve the equilibrium wage.

This is reflected in Figure 3.7, where the minimum wage (W_m) has been set above the market-clearing wage (W_e). At the minimum wage, the labour supply is greater than the labour demand, meaning that a number of people, who are willing and able to work at the going wage, are unable to obtain employment. This is clearly an inefficient allocation of resources because valuable labour is not being utilised in the production process. The country will be operating inside its PPF and the maximum volume of production, and satisfaction cannot therefore be achieved. New classical economists would suggest that, using their traditional model of the competitive labour market, Australia's higher-than-world-average minimum wage explains why it is harder for Australia to achieve lower unemployment rates, even when the economy is achieving its potential output. In Chapter 5 you will discover that when Australia's economy achieves full employment, there is still approximately 5% of the workforce who are unable to find a job. In contrast, the US is able to achieve a lower unemployment rate (currently 3.8%) in part, due to its lower minimum wages.



On the other hand, a recent study by the RBA concluded that increases in the minimum wage did not cause loss of jobs or hours worked. The study suggested that it might actually contribute to increases in employment. As more empirical studies are undertaken around the world, it might be harder to argue that the imposition of minimum wages causes the labour market to remain in a state of disequilibrium.

Figure 3.7



The 'artificially' inflated wages in some industries also alters the structure of relative prices in the economy. Australian businesses which open on Sunday are particularly affected because they are forced by law to pay penalty rates. Businesses which attempt to compete with international firms may also find it difficult to keep their prices lower. The high wage costs in Australia may go some way to explaining why Australian cities are some of the most expensive places in the world to live. We pay more for groceries, clothing, entertainment and technology. This could, in part, be explained by our high labour costs. This means that the government's intervention effectively reduces the purchasing power of many Australians whose wages are determined by market forces.

Study tip

Some students have trouble visualising the impact of a price floor or price ceiling on a D/S diagram. Any artificially set price ceiling will actually always be below the market equilibrium price, and the price floor will always be above the market equilibrium price. One way to remember this is the saying that 'the floor is on the ceiling and the ceiling is on the floor'- to remind yourself that, when talking about government price controls, the ceiling will be closer to where we normally consider a floor to be, and the floor will be closer to what we think of as the location of a ceiling in the real world!!

The minimum wages also distorts the **price mechanism**. The relative wages of those whose remuneration is determined by market forces may not be affected, but relative wages might be. The wages of those professions covered by minimum wages are more than likely to be artificially inflated such that the relative wages of the skilled to unskilled might be reduced. This could affect the allocation of scarce labour resources in the economy with there being an under allocation of labour resources to certain professions because the relatively higher wage does not justify the extra training and/or effort.

Subsidies

Subsidies have been discussed extensively in this chapter as a potential way to correct market failures. They have been discussed in the context of their use to encourage the production and consumption of public goods, products that convey positive externalities and to alter relative prices so that people move away from goods that impose external costs on others. A subsidy can take the form of a direct payment from the government to supplier, a tax concession, a low interest rate loan or a reduction in the price charged for government services.

Like many countries around the world, Australia provides subsidies to carbon intensive producers. The Organisation for Economic Co-operation and Development (OECD) estimates that governments who signed up to the Paris Agreement in 2015 (designed to combat climate change) still spend approximately \$400 billion in fossil fuel subsidies. In Australia, half of the subsidy is granted through the Fuel Tax Credit Scheme where firms that use diesel on 'non-public' roads do not have to pay the excise tax. State governments also provide generous grants to build the infrastructure that these companies need to lower their costs of production.



The OECD highlights the inefficiencies that result from these subsidies:

Subsidies often introduce economic, environmental, and social distortions with unintended consequences. They are expensive for governments and may not achieve their objectives while also inducing harmful environmental and social outcomes. ('Subsidy reform and Sustainable development', OECD, 2007)

These subsidies significantly alter the incentives of the relevant fossil fuel users, and ultimately this affects relative prices and how resources are allocated. Even if the burning of fossil fuels did not cause climate change (which almost all scientists believe it does), the alteration to **relative prices**, in and of itself, is an unnecessary distortion to the market. It effectively lowers the cost of production for those mining the fossil fuels and any industry that relies on fossil fuels as a source of energy. This shifts their supply curve to the right resulting in a lower equilibrium price and a greater-than-free market volume being sold.

In general terms, subsidies lead to a greater volume of production in the industry than what may have happened in a free market. The government is effectively encouraging more production in this area at the expense of other areas (and the subsidies could be allocated by the government to education or healthcare that would generate positive externalities). The governments are also actively supporting an industry that is known to add to carbon emissions (and therefore negative externalities). This action effectively reduces the ability of nations to achieve sustainable development, a goal which would promote improvements in inter-temporal efficiency.

In relation to the subsidies being provided under the current **'Direct Action Plan'**, the Federal Government notes that the subsidies encourage businesses to become less reliant on carbon intensive production and therefore helps to achieve a more efficient allocation of resources. However, critics claim that 'Direct Action' is an inefficient way to reduce carbon emissions because, in some cases, the subsidies are being provided to businesses who were already planning to invest in the carbon abatement methods or technologies even without government financial support. In this respect, the policy becomes a specific example of government failure that leads to a misallocation of resources. In simple terms, scarce government funds are being needlessly allocated to the relevant businesses, which comes at an opportunity cost in terms of the lack of funding for other projects that have the potential to offer greater value for society.

Study tip

Chapter 12 (Section 12.3) also examines subsidies in the context of aggregate supply policies and efficiency in the allocation of resources.

Protectionism

Governments around the world try to give their local industries a competitive advantage so that they don't lose sales to foreign suppliers. This will be discussed at length in Chapter 7 which covers Area of Study 3 in Unit 3, but it is worth an initial discussion to show how this form of intervention in the market can lead to sub-optimal outcomes for society. One method of protecting local industry is to impose a tariff (a tax) on imported goods. This can be expressed as a percentage of the imported price of the good or a fixed amount per item. Australia's car tariffs peaked in the 1980s at rates above 100%, effectively more than doubling the price that consumers had to pay for imported (and as it turned out,

domestically-produced) vehicles. Since the 1990s, the tariffs on a whole range of imported goods have been reduced, with motor vehicle imports now facing a tariff of only 5%. While Australia has been one of the leading countries to promote free trade, including reductions in tariffs and other forms of protection, its trading partners have not been so generous. Despite signing a free trade deal with Japan, for example, the Japanese government imposes a tariff on Australian sugar of between 70% and 110% (depending on the grade of sugar).

In 2018, The US Government led by Donald Trump engaged in an extensive trade war with other countries, particularly those who had positive trade balances with them such as China. While it is beyond the scope of this chapter to fully analyse the effects of the trade war, it is interesting to note that the IMF (International Monetary Fund) estimated that the cost of the trade war could amount to \$US430 billion or a decrease in global economic growth by 0.5%. On the surface, tariffs may be seen as a way to create demand for locally made goods and therefore create employment opportunities. Labour resources may be seen to be more fully employed, which, it could be argued, is an efficient allocation of resources. However, rather than create extra employment in the US, the increased tariffs will, over time, result in higher prices for consumers and an increase in the unemployment rate. The imposition of tariffs and other forms of protection are usually associated with a negative effect on a number of types of efficiencies as outlined below.

Technical efficiency suffers. Protectionism effectively reduces the level of competition in the economy. As was discussed at the start of this chapter, competition imposes a discipline on firms such that they seek to lower their costs and to do so they must try to achieve productivity improvements. When there is a 'buffer' from competition (because the price of competitors products are artificially inflated by tariffs), firms may become complacent and be less concerned about finding ways to improve their performance.

Allocative efficiency suffers. Tariffs are a distortion to the price mechanism and therefore they influence incentives and behaviours of consumers and businesses. The higher relative price of imported items allows local manufacturers to charge higher prices than those that would eventuate in an unregulated market. Therefore resources move into somewhat inefficient industries, whose ability to produce goods efficiently is inferior to those that could be made in another country. Valuable resources are not necessarily allocated to those areas which could generate greater returns for businesses, and therefore the economy. This will be explained further in Chapter 7 under the topic of comparative advantage. Society's wellbeing is not being maximised because the combination of goods and services that is produced does not generate the highest level of value. The prices of both the locally made and the imported products are higher so the consumers cannot access as many goods and services with their income.

Dynamic efficiency suffers. Tariffs and other forms of protection reduce the ability of the market to provide clear price signals. The ongoing subsidisation and other forms of protection offered to the car industry meant that they paid too little attention to changing conditions of demand. For example, during the early 2010s, oil prices were consistently above \$90 (US) per barrel resulting in petrol prices above \$1.50 per litre in Australia (a very high price at the time). Not surprisingly, consumers started to show interest in vehicles that were more fuel efficient. However, both Ford and Holden made little change to the types of cars they produced and offered for sale in Australia. Their lack of dynamic efficiency (their inability to respond to changing consumer demands) was, in part, due to the fact that they received generous subsidies from the government that meant they were still able to make a profit even when their sales were rapidly declining.

Moral hazard

In some circumstances, actions taken by government can result in moral hazard. Regulations introduced by government can result in economic agents changing their behaviour in such a way that it is sub-optimal from society's point of view. For example, the government has in place legislation that prevents **unfair dismissal** for a wide range of employees (with unfair dismissal being where dismissal from a job is deemed to be 'harsh, unjust or unreasonable'). To avoid having a judgement of unfair dismissal made against them, the employer needs to show that they have actively worked with the employee to review their underperformance and give them the opportunity to improve. An employee, knowing that they have this opportunity in the future, may, at least in the short term, reduce their work effort. They could have a disruptive effect of the organisation they work for or simply reduce the productivity of the workplace, leading to decreased productivity and technical efficiency.



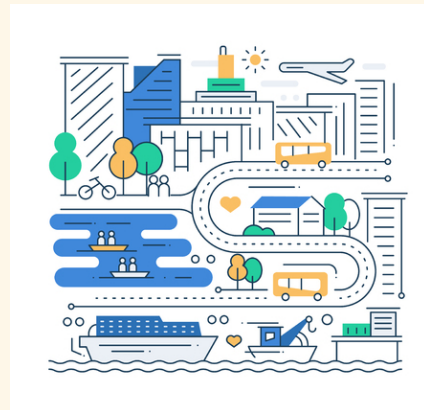
The government's **guarantee of bank deposits** also alter the behaviour of the Australian banks. Knowing that deposits up to \$250,000 will be effectively guaranteed by the Australian government may reduce the risk aversion of the banks,

and banks may lend out more to borrowers with higher risk profiles than they would if they were fully accountable for their customers' deposits. The Financial Services Royal Commission of 2018 highlighted a number of inefficient practices undertaken by the banks and highlighted the extensive nature of their moral hazard. This represents an inefficient allocation of the scarce funds and could undermine the integrity of the banking system in the long term.

As each of the above examples have illustrated, government actions can have unintended consequences. As you proceed through Unit 4, you may also be exposed to other areas of government intervention that have resulted in changes in resource allocation, which may not necessarily improve the efficiency of outcomes.

Activity 3h - Infrastructure – does government get it right?

In subsequent chapters, you will learn about the importance of infrastructure spending for economic growth and development. Infrastructure is usually built by governments to facilitate the smooth functioning of the economy. It is sometimes referred to as the 'framework' upon which economic activities are based. Examples of key infrastructure spending include the energy grid, telecommunications (including the National Broadband Network), water and sewerage, roads and rail networks, ports and airports. In a free market, infrastructure would be underprovided because it provides an extensive number of positive externalities and some infrastructure has some public good qualities (because it might be difficult to charge users).



The provision of infrastructure helps to boost the productivity of a nation and helps to lower the costs of production for firms. For example, if the government expands the existing road network then it should result in less time for companies and commuters spent in traffic. This means that more deliveries can be made per hour and people might arrive at work feeling less stressed and tired. This flows through to increases in international competitiveness and helps to make a city more liveable.

Given that economies rely heavily on governments to provide infrastructure, there is the potential that a sub-optimal allocation of resources is achieved. In a 2018 article for The Age, Ross Gittins discussed how Australia has underinvested in key infrastructure relative to rapid population growth, and how it also tends to allocate resources to areas that don't necessarily maximise society's wellbeing (government failure).

One of the key problems with allocating scarce funds to infrastructure is that the decisions are not based on market forces. It is difficult for the government to determine which area of spending will generate the best return for the economy. The nature of the political process is such that governments are subject to political bias and often respond to lobby groups. This means that infrastructure projects that might win votes in a marginal seat may be chosen over alternative projects that could add more net value for the nation. Governments also tend to prefer projects that will grab the media's attention, such as new initiatives that make for good news stories, when improvements to existing infrastructure may have cost less and generated the same or higher social returns. The world is filled with examples of 'white elephants'- a term used to describe projects that usually cost more than the benefits they provide, are underutilised and which can end up costing the government more money in maintenance.

The building of the National Broadband Network highlights how government failure can reduce the viability of businesses and the living standards of households. When the NBN was first announced in 2009, Australia was promised a world-leading fibre-to-the-home internet connection. Following the election of a government led by Tony Abbott in 2013, the building project was altered in an attempt to reduce waste and save money. Unfortunately, the NBN (which is still yet to be completed) has been fraught with problems. Many people and businesses were disconnected from their existing broadband services and faced days without a connected phone or internet service. This significantly reduced the ability of businesses to meet their customers' needs and reduced their productivity. Households with no reliable internet connection made complaints to the ombudsman at record levels in 2017/18, highlighting how their living standards had been negatively affected by the implementation of the NBN. Rather than improve living standards as the NBN was originally intended to do, it is arguably a source of government failure.

Additional resources: <https://www.news.com.au/finance/economy/australian-economy/australias-billion-dollar-infrastructure-boondoggles/news-story/0788bf8b89e9a4792151a14ff34915f3>; <http://www.rossgittins.com/2018/07/why-so-much-spending-on-infrastructure.html>

Questions

1. With reference to one example, explain how an area of infrastructure spending may be associated with positive externalities.
2. Explain why a free market may underallocate resources to key areas of infrastructure spending.
3. With reference to one of more areas of infrastructure spending, explain how non-material living standards may be positively or negative affected through government intervention.
4. Research examples of government spending where scarce government funds have been wasted on inappropriate infrastructure projects. Explain how the efficiency of resource allocation has not been maximised by such projects.

Review Questions 3.3

1. Explain what is meant by the term 'government failure'. Link your response to the nature of unintended consequences and the efficiency of resource allocation.
2. With reference to a specific example, explain why the government may wish to introduce a price ceiling in a market.
3. Explain how the imposition of the price ceiling, explained in question 2, might lead to 'unintended consequences' that result in a reduction in allocative efficiency.
4. With reference to the labour market, explain the intention behind the government's decision to implement minimum wages (a price floor on wages).
5. Explain how minimum wage legislation distorts the free operation of the labour market and may lead to an inefficient allocation of labour resources.
6. With reference to at least two specific examples, explain why the government may provide subsidies to private firms.
7. Identify one industry where subsidies may be seen as unnecessary and may distort the effective operations of the market system.
8. With reference to your answer in question 7, explain why the government intervention leads to an inefficient allocation of the nation's resources.
9. Explain, with reference to one example, why protectionist policies result in a reduction in allocative and technical efficiency.
10. Identify and explain one recent example where government action has encouraged consumers or businesses to change their behaviour in such a way that it is no longer optimal in terms of society's wellbeing.

Multiple choice review questions

- 1. A highly competitive market is unlikely to be associated with**
 - a) A large number of buyers and sellers
 - b) A high degree of government intervention
 - c) Profit and utility maximising behaviour
 - d) Access to valuable information to assist with rational decision making
- 2. One of the key benefits associated with increasing levels of competition is**
 - a) More differentiated products for consumers
 - b) Firms are able to achieve lower costs due to economies of scale
 - c) Firms are more likely to respond to changes in tastes and preferences
 - d) Inter-temporal efficiency is improved
- 3. Market failure is likely to occur in an economy where**
 - a) The unemployment rate is below 5%
 - b) Cigarette prices are increasing due to higher taxes
 - c) Education is provided to all citizens at subsidised prices
 - d) Firms do not pay for their external costs
- 4. An example of a public good is**
 - a) Education
 - b) A haircut
 - c) Police services
 - d) Public transport
- 5. A negative externality associated with the consumption of alcohol is**
 - a) The extra tax that needs to be paid to purchase the beverages
 - b) The jobs created for those who make the alcohol
 - c) The pollution caused by the factory that produces the bottles of alcohol
 - d) The anti-social and violent behaviour of those who may have had a 'few too many' drinks.
- 6. A positive externality will be created from the production of**
 - a) Gas masks
 - b) Alcohol
 - c) Honey
 - d) Cigarettes

- 7. A decision by the Victorian government to subsidise up to half the price of solar panels for households earning less than \$180,000 is most likely to**
- Reduce negative production externalities
 - Reduce negative consumption externalities
 - Increase positive production externalities
 - Increase positive consumption externalities
- 8. Public goods are likely to be:**
- Provided in excessive quantities in a free market
 - Unprofitable for private firms due to the free rider problem
 - Provided in the right quantities in a free market
 - Produced by public companies
- 9. The building of a new government library that results in increased access to educational materials is likely to be classified as intervention that seeks to address which market failure?**
- Asymmetric information
 - Positive externalities
 - Negative externalities
 - Public goods
- 10. A decision by the government to include health ratings on food products in Australia is likely to**
- Decrease the costs of production
 - Reduce the degree of asymmetric information
 - Contribute to negative externalities
 - Reduce access to common access resources
- 11. The government could correct the market failure associated with the consumption of cigarettes by:**
- Imposing a price floor on the sale of cigarettes
 - Allowing the market to allocate resources based on tastes and preferences
 - Subsidising the production of e-cigarettes
 - Increasing the level of competition in the cigarette industry
- 12. A government decision to ban the sale of products with microbeads is likely to**
- Shift the demand curve to the right until the ban is introduced
 - Shift the supply curve to the right until the ban is introduced
 - Shift the demand curve and the supply curve to the left
 - Increase government tax revenue
- 13. The market failure caused by asymmetric information associated with the purchase of a second-hand car results in**
- An overallocation of resources to the production of new cars
 - Excessively high prices for quality second-hand cars
 - An excessive number of second-hand cars being sold on carsales.com.au
 - An increase in the level of petrol consumption in the country, causing excessive pollution
- 14. Which of the following is a non-government initiative that can reduce the market failure associated with asymmetric information?**
- A law that states that all ingredients must be listed on food products
 - A ban on imported bananas
 - A decision by a second-hand car buyer to undertake an RACV inspection
 - A subsidised education campaign to teach students about the dangers associated with drinking alcohol before the brain is developed
- 15. Moral hazard can occur in the labour market because**
- Workers cannot be monitored all of the time
 - The wages paid to workers in Australia are too low
 - Employees do not receive effective training
 - The workplace is lit by LEDs that reduce the concentration and focus of workers

16. An example of a common access resource is

- a) The police force
- b) The garbage collection provided by local councils
- c) The atmosphere
- d) The Melbourne Zoo

17. Common access resources could be used more sustainably if governments

- a) Impose taxes on cigarettes
- b) Ban the sale of alcohol to minors
- c) Subsidise the fossil fuel industry
- d) Ban the sale of plastic bags

18. A tax on carbon emissions is likely to result in

- a) A change in relative prices and increased exploitation of common access resources
- b) A reduction in the relative price of electricity generated from solar panels and a more inter-temporally efficient allocation of resources
- c) An increase in the relative price of petrol and a decrease in the demand for electric cars
- d) An increase in government revenue and an increase in the allocation of labour resources to the coal mining industry

19. The consumption of sugar in Australia may be sub-optimal due to

- a) Positive externalities and asymmetric information
- b) A lack of public goods and depletion of common access resources
- c) Negative consumption externalities and asymmetric information
- d) Negative production externalities and positive consumption externalities

20. Asymmetric information could be reduced, and positive consumption externalities increased if

- a) Tertiary education returned to a price of zero
- b) Cigarettes were banned completely
- c) There was a tax on the provision of internet services
- d) Fresh food was subject to the GST

Chapter 3 Applied Economic Exercise

Climate change - negative externalities, common access resources and asymmetric information

One of the most challenging negative externalities for governments around the world to deal with is climate change. Climate change is the subject of much debate, but most scientists agree that the burning of fossil fuels by humans has contributed to climate change. The burning of fossil fuels releases carbon dioxide (and other greenhouse gases) into the atmosphere and this is likely to alter weather patterns in the future. Climate change can be linked to a number of market failures: negative externalities in production and consumption, asymmetric information and common access resources. Each of these will be considered in the exercise, along with previous and current government intervention that has sought to correct market failures.

When fossil fuels are burnt to produce goods or services used by households (for heating and lighting for example), the carbon that is released into the atmosphere contributes to climate change. This imposes a cost on both current and future generations. It is predicted by scientists that climate change will lead to more erratic weather patterns, such that droughts, floods and bushfires will be more severe and more prevalent. This will make it harder for farmers to grow crops, reducing the food available. It may also disrupt supply because key infrastructure and businesses are damaged or destroyed. One significant example, highlighted in the Australian Government sponsored Garnaut Report was the loss of the Great Barrier Reef. This tourist attraction is responsible for the creation of billions of dollars in tourism revenue each year, and its loss could therefore be associated with lower living standards for those who make their living in this area.

The earth's atmosphere and clean air in general could also be considered a common access resource. In a more lateral sense, it could be argued that relatively stable weather patterns are a common access resource that we have enjoyed but which can be reduced through human activity. When consumers and businesses are involved in the burning of fossil fuels they are effectively using the earth's atmosphere as a receptacle for their waste. This is a whole world phenomenon and, for the most part, it is hard to exclude people from engaging in this activity and using the atmosphere in this way. Unfortunately, the greater release of carbon dioxide results in a reduction in both clean air and an 'appropriately balanced atmosphere' for future generations. It could therefore be argued that the use of this common access resource

is excessive and that those who will be most affected have the least ability to influence decisions that are made in markets in the current time period (i.e. future generations). Climate scientists have also suggested that Less Economically Developed Countries (LEDCs) are also ill-equipped to deal with the changes even though it is not their actions that have contributed the most to climate change.

One of the biggest challenges facing the government is that they face uncertain outcomes. They essentially have incomplete information. Only those who will experience the changes in weather patterns in the future will be able to determine the impact of decisions made in the current period (and even then there will be some who cast doubt that the disruptions to weather patterns have been caused by human actions). This imbalance in knowledge makes it difficult for governments to determine the most efficient way to correct what is a 'virtually unknown' cost to society. It is therefore very difficult for governments to determine what action to take.

Many countries around the world have recognised the need for action on climate change and governments have implemented a wide range of policies to curb emissions. Australia briefly had a carbon tax that was designed to internalise (as much as was feasible) the external costs associated with the use of fossil fuels. This resulted in an increase in the cost of production for energy intensive industries and influenced a change in the allocation of resources. Electricity prices increased and consumption decreased. A study by the ANU highlighted that the Carbon Tax was responsible for a reduction in emissions by 17 million tonnes. The carbon tax legislation was repealed by the Abbott Government and replaced by 'Direct Action'. Direct Action is the opposite to the carbon tax, in that it rewards those who implement projects that cut emissions rather than punishing those who actually release carbon emissions. The initiative also costs the government in the form of increased expenditure rather than generating revenue because the government offers grants to those firms who are able to cut emissions for the lowest cost. In 2016, the Government's Climate Change Authority recommended that the Direct Action Plan should be supplemented with an 'emissions intensity scheme.' Under this proposed scheme the 'baseline' level of emissions could be gradually reduced over time. The baseline level of emissions for an industry could initially be set at the current level and this amount would be divided by the number of producers in an industry to determine the average level of energy intensity. Those who produced above average would have to purchase 'credits' from those who are below the average. This would effectively raise the costs for heavy polluting emitters in an industry and reduce the costs for low emitters, and therefore alter the allocation of resources over time. At the time of writing, the government had not committed to such a scheme and there was a high degree of uncertainty about future policy action to curb emissions (this lack of information also made it difficult for firms to plan their investment and production decisions that could have the potential to curb emissions).

One of the greatest challenges faced by governments when designing policies with regards to climate change is that there is also asymmetric information with regards to the actions that may be taken in other countries. Climate change is a global phenomenon and requires international cooperation. One significant step towards international cooperation and action was the development of the Paris Climate Change Agreement which entered into force in 2016. At the time of writing, 180 countries had ratified the international treaty that seeks to limit warming by 1.5 to 2 degrees Celsius over the coming century and to make a commitment to implement the best technologies available to reduce emissions.

Further information on the Paris Climate Change Agreement can be found at: <https://unfccc.int/process/the-paris-agreement/what-is-the-paris-agreement-0>

Application questions

1. Explain how current production and consumption decisions may impose costs on people who may not yet be born.
2. Explain why economic growth rates could be lower in the future if carbon emissions continue to grow in the future.
3. Explain why the atmosphere may be considered a common access resource. As part of your answer, refer to the criteria used to define common access resources.
4. Explain why it might be in the interests of fossil fuel producers to conceal information from governments about the effects of fossil fuels on climate change. Link your answer to the concept of asymmetric information.
5. Explain, with reference to negative externalities and common access resources why production and consumption of goods and services that use fossil fuels causes market failure.
6. Identify and explain one government policy that could be, or has been, utilised to reduce the market failure associated with carbon emissions.

Chapter summary

1. Perfect competition is seen as the benchmark of comparison as it is the most competitive of all market structures.
2. Perfectly competitive markets have low barriers to entry as it is relatively cheap and easy to set up a business in the market.
3. Perfectly competitive markets have a large number of fully informed buyers and sellers, meaning that all economic agents are price takers.
4. Products sold in a competitive market are assumed to be homogenous.
5. Competitive markets are also usually associated with mobile resources, minimal government intervention and perfect information.
6. Competition promotes allocative efficiency because producers, whose income depends on what they sell, will look to offer those goods and services that are in high demand.
7. Competition promotes technical efficiency because firms selling homogenous goods will need to lower their prices to attract customers.
8. Competition promotes dynamic efficiency because firms will not want to waste resources producing products that are no longer in demand and are less profitable. Therefore they will look to shift resources quickly to meet the changing needs and wants of consumers.
9. Market failure exists when unregulated markets are unable to direct resources to where they maximise society's wellbeing.
10. Public goods are non-rival in consumption and non-excludable which makes it difficult for firms to extract an adequate profit from production.
11. The characteristics of public goods results in the free rider problem because people can consume the product without paying for it. This leads to an under allocation of resources in a free market.
12. Governments will tend to subsidise or directly provide public goods that are generally perceived to be in society's best interest.
13. Externalities are costs or benefits that are imposed or received by a third party who is not involved in a transaction.
14. Negative externalities (in production or consumption) result in an over-allocation of resources towards some products because the producer and/or consumer do not pay for the external costs imposed on a third party.
15. To correct the market failure associated with negative externalities the government may seek to internalise the external cost by imposing a tax on the producer. This shifts the supply curve to the left and reduces the amount produced and consumed in the market.
16. The government can also reduce the incidence of negative externalities through new regulations that might ban a product or impose conditions on the methods of production that are undertaken.
17. Negative externalities can be reduced through effective information campaigns
18. Positive externalities occur when the consumption or production of a good or service confers a benefit to someone not involved in the transaction.
19. Positive externalities result in an under-allocation of resources towards some products because the producer and/or consumer are not compensated for the benefit enjoyed by a third party/society.
20. Governments will tend to subsidise the production of those goods and services that generate positive externalities. This shifts the supply curve to the right, resulting in a lower equilibrium price and a greater sold in the market
21. Asymmetric information exists when one party in a transaction (exchange) has greater information about the product than the other.
22. Asymmetric information can lead to the problem of adverse selection, which results in an inefficient allocation of resources.
23. Moral hazard may arise after contracts that establish an on-going commitment between the buyer and seller have been signed. This occurs when economic agents change their 'unobservable' behaviour so that it is less favourable from society's point of view.
24. Markets may correct some degree of asymmetric information without the need for government intervention. Access to reliable information, which might involve screening and/or signaling, can reduce information asymmetry and lead to more rational and fully informed decisions that maximise wellbeing.
25. The government intervenes in markets to protect consumers who have less information available to them than the seller. Australian Consumer Law imposes responsibilities on sellers and gives consumers access to effective redress if they have been sold faulty products.
26. On a number of occasions, attempts by governments to correct perceived market failures has resulted in unintended consequences whereby it is difficult to determine whether society's wellbeing has been improved. This is sometimes referred to as Government Failure.
27. Government failure can also occur when governments seek to undertake measures to promote equity in the distribution of income. Incentives are altered and technical and allocative efficiency might suffer.
28. Protecting local industries, while promoting local employment, may lead to an inefficient allocation of resources because the price system is distorted when the exposure to competition that promotes technical efficiency is removed.
29. Due to political lobbying, governments may also provide favourable subsidies to industries that do not need them. This also distorts the price mechanism and results in a misallocation of the nation's resources.