

# Chapter 1

## An introduction to economics

- 1.1 What is economics?
- 1.2 The basic economic problem of relative scarcity and the need for economic decision making
- 1.3 The concept and applications of opportunity cost
- 1.4 The production possibility curve (PPC) and its applications
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### 1.1 What is economics?

On your way to school this morning, you will have undertaken some form of activity in the economy. You may have consumed breakfast cereal that was purchased from a supermarket; you may have purchased a ticket for a bus, train or tram; you may have been driven to school in a car using fuel and driving on roads provided by the government; or you may have walked through gardens that are maintained by your local council or municipality. At school, you will be provided with a service (education) that is produced by either the government or a private organisation. Indeed, you may even be consuming telecommunication services as you text a friend or download an App during one of your classes!!

All of these activities, and numerous others that take place every single day, can be described as **economic activity**. This is activity that takes place in order to make our lives more enjoyable and/or activity that is designed to help us achieve our goals or to complete our daily chores. The economic activity that we engage in will involve numerous transactions – which typically involve the exchange of money for something in return. For example, the bus ride to school will have required a payment to the bus operator and the use of SMS texting services requires a payment to the telecommunications provider.

Sometimes the form or nature of any transaction in the economy is much less obvious – such as you walking through a park on the way to school. You might ask, how is this an example of an economic transaction when I haven't paid anything? The answer is that the service provided by the park has indeed been paid for, but indirectly, by those paying taxes to governments or rates to councils.



All **transactions** that we undertake, or indeed all economic activity, naturally take place in an economy. An **economy** exists in any place or region around the world where production of goods and services takes place, expenditure on those goods and services occurs and income is made from the selling of those goods and services.

At this introductory stage, think about **production** as the process of making a good or services, such as producing a car; **income** as the money given to those involved in the production of goods and services, such as wages; and **expenditure** as the spending of income on goods and services.

With respect to an economy, it is most commonly defined by a region. For example, in Australia alone, we have several economies: the Australian economy, the Victorian economy, the NSW economy, and so on. Alternatively, an economy can be defined by the system used to determine how decisions about production, income and expenditure take place. For example, later, we will explore the differences between a “market capitalist” economy and a “planned socialist” economy. So, your decision to be at school, consuming education services, is an example of economic activity that is taking place in both the Victorian and Australian economies. The production of the service is made by your school, expenditure is made by your parents either directly (via fees) or indirectly (via taxes), and the income is earned by the school and its teachers. The provision of this education service is also an example of a transaction that is occurring in Australia’s market capitalist economy.



Transaction	Production	Income	Expenditure
7. Jane signs up to a Spotify subscription			
8. Bazil downloads an Economics App from iTunes			
9. Anita calls her mother using her mobile phone			
10. Zaynab buys a pie from the canteen			

## Application Exercise 1b

In the table below, classify each statement as either a positive or normative statement and be prepared to justify your decision.

Economic statement	Positive	Normative
1. Company tax cuts should increase economic activity		
2. The Australian government is spending an insufficient amount on education		
3. Australia is one of the wealthiest countries in the world		
4. Australia's minimum wages are too low		
5. Legalising marijuana for medical purposes will increase the rate of illegal drug use		
6. An oversupply of crude oil contributed to lower crude oil prices over 2015-16		
7. Carbon emissions are contributing to global warming and climate change		
8. The best way to address climate change is to prohibit the production of coal fired electricity		
9. Spending on smart phones creates employment and generates income		
10. The increased use of social media by children is harmful to their long term well-being		

### 1.2 The basic economic problem of relative scarcity and the need for economic decision making

**Economics** primarily concerns why and how individuals or groups make decisions about the transactions they will undertake on a daily basis. As **consumers**, we need to make decisions about the types and quantities of goods and services to consume. Do we buy an Apple iPad or a MacBook? A skateboard or a scooter? A can of Coke or a bottle of water? Do we travel to school on a bus or ride a bike? Do we attend a government or private school? As **producers** we need to make decisions about the materials, machinery or equipment we use to produce the good or service, as well as the workers to employ. In addition, as **income earners**, we need to decide how best to use our labour or skills in order to derive the maximum possible benefit.

All **economic agents** - which are defined as any individual, group or body involved in economic activity - are required to make decisions for the simple reason that there are numerous alternative options available. In other words, there are a number of choices we are required to make from many possible options. We may ask why can't we have it all. Why can't we have the MacBook, the iPad, the Coke, bottle of water, skateboard, scooter and all the other items on our wish list? The answer lies in an economic concept known as **relative scarcity**. As a community, and across the economy, we want an unlimited number of goods and services and our ability to satisfy these **wants** depends on our capacity to produce goods and services – which, in a country like Australia, is quite large, but not limitless. We are therefore limited by the physical constraints placed on us by the amount of **resources** at our disposal.

While in a country like Australia we have an abundance of resources available to produce goods and services, such as land, machinery or workers, these resources are limited when compared to the unlimited demands we place upon those resources. **Relative scarcity** is therefore the core problem determining decision making in every economy around the world: the fact that the wants and needs of societies are larger than the resources available to satisfy those wants and needs.

**Relative scarcity = Wants & needs > resources**

## Needs versus wants

The **needs** of individuals or households in societies can be defined as the basic goods and services that are necessary for our survival. Our core needs are food, clothing and shelter. However, in a wealthy country like Australia, some would extend the list of needs to other items, such as a car, mobile phone, digital tablet or computer. Indeed, some could mount the argument that some individuals don't require clothing to survive, citing those living in warm climates. In contrast, a **want** is considered to be something we desire to have to improve our satisfaction or quality of life, but that is not necessary for our survival. Regardless of whether we classify something as a want or a need, it is still true that relative scarcity will occur.

Why do economists argue that our wants are unlimited? Surely, once we have enough to provide for a good standard of living, wouldn't we slow down our rate of consumption or spending? Whilst this might be true for some, economists argue that it is human nature to always want more. As our incomes grow and we become wealthier, products that were once considered wants, become needs, and products that were previously 'out of reach' become wants. This is largely due the inherent greed of humans, our competitive instincts (wanting more than our neighbours or trying to keep up

with the conspicuous consumption of others) and our materialistic society more generally. The pervasive marketing and advertising undertaken by businesses increases our wants further, helping to make relative scarcity an impossible problem to solve. In other words, no matter how many needs we fulfil, more wants will spring up in their place, meaning our wants and needs will always outstrip the relatively scarce resources available to satisfy them.

If you have any doubts about this idea, consider your own idea about your "needs" compared to those likely to have been experienced by your grandparents when they were your age. It is likely that many of the items you currently consider "needs" would not have even been considered as possible wants by your grandparents when they were growing up.

## Resources

**Resources** are those things that are used to produce goods and services; they are also referred to as **factors of production**. They exist in many different forms, including machinery, equipment, workers, managers, factories, forests, and so on. However, resources all have two important characteristic in common: they are all key inputs in the production process and they all have possible alternative uses. Every organisation involved in production must have examples of 'factors of production' that fit into each of the four categories below:

**Land or natural resources** refers to all those resources that occur in nature. These can be used in the production process to generate more elaborate products, or consumed in their raw form. Examples of such resources include: water, forests, minerals, land, animals, fruit and vegetables. It may seem obvious, but all production depends on natural resources.

**Labour** refers to the mental and physical effort by humans in the production process. It primarily includes all of the workers employed by businesses or governments in return for income in the form of a wage or a salary.

**Capital** refers to those resources that have been made by combining labour and natural resources to create a more sophisticated input in the production process. Capital goods are made with the intention of making more goods and services in the future and generally these will increase the efficiency with which resources can be converted into products for final consumption. Examples of a capital resource include machinery, factories and equipment.

**Entrepreneurship** (or enterprise) refers to the skills of those individuals who combine our resources to produce goods and services. They take financial risks to establish enterprises (businesses) and are extremely important to wealth creation for every nation. They include not only high profile entrepreneurs like Bill Gates, Elon Musk,

## Application exercise 1c

Create a list of five goods or services that, over time, have gone from being "wants" to "needs". Justify your choices.



### Study tip

*Processed materials used in the production of goods and services, such as chemicals, fuels, or plastics used to manufacture many goods are not resources as defined earlier. Instead they are simply referred to as inputs.*

### Study tip

*Whether items are considered to be 'capital' in nature depends on how they are used. For example, a car or computer used by a household for private purposes is considered to be a consumer good. However, if they were used by a business they would be considered to be capital goods.*

Jeff Bezos, Richard Branson or Mark Zuckerberg, but include all business owners. In return for providing their expertise or skills to the business sector of the economy, entrepreneurs will receive income in the form of a profit.

## How relative scarcity affects decision making

Earlier, the concept of **economic activity** was introduced and described as the process of production, income and expenditure that takes place in every economy. Each group responsible for the decision making - producers, income earners and consumers - will experience the problem of relative scarcity in unique ways. However, each group will need to make economic decisions that are ultimately defined by the fact that they cannot satisfy all of their wants or needs with the resources at their disposal.

The **producers** involved in decision making face the problem of relative scarcity by determining the best way to combine resources in order to best satisfy consumers and therefore make the most profit. Think about the production of a simple product like a banana. It involves the use of farming land (the banana plantation), machinery (tractors), workers (farm hands) and, of course, the entrepreneur (the owner/farmer). All of these factors of production are required to produce the bananas that end up in the fruit shops and supermarkets around the country. The producer or the entrepreneur needs to make economic decisions on a daily basis due to the problem of relative scarcity. The farmer will make decisions such as:

- Do I continue to use all of my land for banana production or do I consider using some or all of it for some other crop, such as guavas, or indeed for some non-farming activity, such as eco-tourism?
- How much labour do I employ on the farm?
- Should I use more machinery instead of labour?
- What types of machinery or farm equipment should I employ?



With respect to **income earners**, which include both workers and entrepreneurs, they need to determine how best to use their income earning capacity, or their skills and labour, in order to achieve the best possible outcome. An individual worker can work in a number of different areas or industries, meaning that their skills are often transferable or that labour skills have alternative uses. For example, a truck driver involved in the transportation of bananas and other fruit around the country will need to make decisions such as:

- Do I continue offering my labour services to the food transportation industry? Should I relocate to a mining state and offer my services as a truck driver on a mining site, where the wage is significantly higher?
- Do I retrain or enrol in a course of study that enables me to work in another industry?
- Do I withdraw my labour services and use my wealth to become an entrepreneur by creating a transportation (or some other) business of my own?

With respect to **consumers** we need to make decisions about how we can best use our income or wealth to gain satisfaction from spending or consumption. Ultimately, we all make decisions every day on how best to use our money in order to maximise our well being or living standards. This means that money is relatively scarce and another way of viewing the problem of relative scarcity is to say we don't have enough money to satisfy all of our wants and needs.

### Study tip

*Note that money is not a resource in itself. While it has important functions, such as a store of value and a means of exchange, in itself, it cannot be of use in the production process as it is only a piece of paper or a coin. Therefore, in Economics, it is incorrect to argue that money is a scarce resource.*

## Review questions 1.2

1. Distinguish the types of economic decisions made by consumers and producers.
2. Define economic agent.
3. Define the term relative scarcity.
4. Distinguish a need from a want.
5. Discuss whether a nation can solve the problem of relative scarcity.
6. Define the term resources and explain why resources are also referred to as factors of production.
7. Discuss how one decision made by a producer can be linked to the concept of relative scarcity.
8. Discuss how one decision made by an income earner can be linked to the concept of relative scarcity.
9. Discuss how one decision made by a consumer can be linked to the concept of relative scarcity.

### Application Exercise 1d

In the table below, classify each item as either a want or a need and be prepared to justify your decision.

Item	Want	Need
House		
Television		
Mobile phone		
Motor vehicle		
Train services		
Food and water		
House		
Underwear		
Dinner suit		
Digital tablet		

### Application Exercise 1e

In the table below, classify each of the resources as either natural, labour, capital or entrepreneurship and be prepared to justify your decision.

Item	Natural	Labour	Capital
Tractor			
Computer used at home			
Teacher			
Mineral sands			
Computer used at Australia Post			
Great Barrier Reef			
A computer programmer			
The Prime Minister of Australia			
A motor car used as a taxi			
Farmland			

## 1.3 The concept and applications of opportunity cost

The use of our scarce resources in one economic activity means that those same resources cannot be used in another. For example, assume that a farmer has a plot of land, let's say 1,000 acres, from which she could produce bananas, guavas or any other crop. It may be that 500 acres is devoted to banana production and 500 acres to the production of guavas. Alternatively, some other combination for the land use could be determined. Regardless, the fact remains, that once the farmer makes a decision about how the land will be used in production, it involves a sacrifice. It means that the farmer is sacrificing the opportunity to use the land for alternative crops or uses. The nature of the sacrifice is defined by the range of alternative land uses available to the farmer, such as melon or pineapple production, or a wildlife sanctuary, nature reserve or even a tourist facility. This idea of there being a cost involved in all economic decision making is referred to as **opportunity cost**. The opportunity cost of using the 1000 acres for a particular purpose is, specifically, the value of the next best alternative for which the land could be used. This requires a judgement on the relative merits of each alternative. The option considered to be the next best alternative becomes the opportunity cost.

Opportunity cost is therefore the benefit sacrificed (economists speak about the benefit “foregone”) when choosing one alternative over others. It is measured by the value that would have been created by using the resources in their next best alternative use. The fact is that whenever we decide to use our resources in some way, it necessarily involves us giving up the opportunity to use those same resources in some other way.

All rational **economic agents** will seek to minimise their opportunity costs when making decisions or undertaking economic transactions. This means that the overall net benefits (the benefits gained minus the costs incurred) from any decision (or transaction) will be the highest possible. Assume that the farmer with 1000 acres of land has conducted extensive research and determined that the land will yield the following benefits in dollar terms:

- \$100,000 of annual income if used for banana production;
- \$80,000 if used for guava production; and
- \$60,000 if used for pineapple production.

#### Study tip

*In Economics, it is necessary to assume that economic agents are rational in their decision making. This means economists assume that economic decisions are made with a view to maximising benefits and minimising costs. Without this important assumption, the predictions made by economists become much less reliable.*

If the farmer is purely motivated by profit, the rational decision would be to use the land for banana production, with the opportunity cost being the \$80,000 of guava revenue that will be sacrificed. The decision is rational because the \$100,000 of revenue gained from producing bananas will be greater than the \$80,000 of revenue that would have been gained if the farmer used the land for guava production.

However, assume now that the farmer decided to use the land for guava production and expects to receive \$80,000 per year. This is clearly an irrational decision for a farmer who is solely motivated by profit. The opportunity cost of guava production is now the \$100,000 of revenue that has been sacrificed. In this case, the farmer has not minimised opportunity costs because the opportunity cost of the decision is \$100,000 (the money that could have been earned from the “next best alternative”) when it could have been \$80,000.

## Application Exercise 1f: Smoking and opportunity costs

Consumers are bombarded with different messages influencing their decision making, many of which are deliberate attempts by businesses to create a demand for their product through marketing and advertising. Ultimately, the decision to purchase any particular good or service will come at both a financial cost (the cost of the product) as well as an opportunity cost (foregoing the value of the next best alternative). For most purchases, the opportunity costs are quite transparent. The purchase of an apple for \$1 means that we forego the opportunity to use that same \$1 to purchase a pear. The benefits that are foregone when not purchasing the pear are similar to the benefits to be enjoyed from consuming the apple and these are easily measured (such as satisfied hunger and a healthier diet).

This is not the case with a decision to purchase a packet of cigarettes. For many years tobacco manufacturers have been able to employ sophisticated marketing strategies to attract young smokers, hoping to create brand loyalty and capture them as customers for life. The decision to take up smoking involves opportunity costs, many of which are delayed, making it much more difficult for consumers to make a rational decision. When a young person decides to purchase cigarettes they will equate the cost of a packet of cigarettes, perhaps \$20, with the potential benefits, including the perception of being cool, tough or independent. But the long term costs in terms of damage to health and well-being are delayed so far into the future that many young consumers generally don't take this into account when evaluating the net benefits (i.e. the benefits minus the costs) of smoking.



In terms of opportunity costs, the benefit that could be derived from using that \$20 in the next best alternative (which might be health food or even saving in the bank) is clearly superior to the net benefits that are gained from smoking. Accordingly, the opportunity costs of smoking are higher than opportunity costs of using that same \$20 to buy most other goods. In other words, when consumers decide to spend \$20 on a packet of cigarettes, all the evidence suggests that they are not minimising their opportunity costs. But why do people still smoke? Are their hidden or unknown benefits of which only smokers are aware? Are consumers simply making irrational decisions? Or are tobacco manufacturers successfully blinding consumers to the long term damage that smoking causes, making an irrational decision appear more rational?

### Questions

1. Define the term ‘net benefits’ and discuss how it might influence the decision making of consumers.
2. Illustrate one way that tobacco manufacturers seek to persuade consumers to purchase their product.
3. Outline some possible alternatives to spending \$3000 on cigarettes in a given year.
4. Determine the opportunity cost of spending \$3000 on cigarettes over a one year period.
5. Discuss why the consumption of cigarettes may not be the most rational decision, using the concept of opportunity cost in your answer.

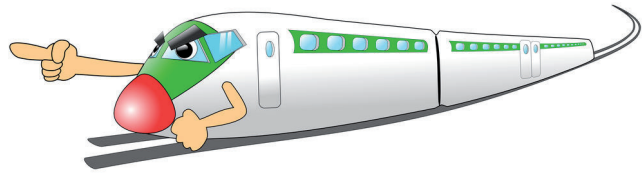
## Further applications of opportunity costs

Each of us experience opportunity costs every day of our lives simply because we make economic decisions on a daily basis. A decision to leave school at the age of 17 may come with financial benefits, such as a full-time income, as well as other benefits, including freedom from the rules and constraints existing at educational institutions. However, it will come at an opportunity cost which is likely to be the benefits that might be provided by a tertiary education, such as a potentially larger income in the future, or possibly improved status in the community.

Once in employment as income earners, individuals will often decide on a change of employer or even a career change. Clearly, these decisions are made on the basis that the opportunity costs of staying with their existing employer have become too great. To illustrate, the Western Australia and Queensland mining boom that occurred in recent years markedly increased the opportunity costs of remaining employed in other areas, particularly for those living in WA and Queensland. The shortage of mining labour resulted in the wage paid to miners increasing to relatively high levels. Someone employed in Western Australia or even Victoria, as a truck driver with Linfox for example, earning \$75,000 per year, realised that the next best alternative use of her labour skills would have yielded an income in the order of \$150,000 on one of the mines. As the mining wage continued to increase (in order to attract workers to mines), the

opportunity costs increased for truck drivers in the transport industry, and many truck drivers moved from the transport industry to the mining industry. This was a rational decision by these economic agents who were keen to minimise the opportunity costs associated with employment. Of course, since the end of the mining boom, the process has worked in reverse, as mining wages have fallen relative to non-mining wages.

Governments have substantial (but limited) funds at their disposal to use for society's benefit and these funds are collected through taxes. If the federal government chooses to spend \$2 billion on building a fast railway line between Geelong and Melbourne (as promised in 2019), it foregoes or sacrifices the opportunity to use that same \$2 billion for investment in health, education or public parks. The opportunity cost in this example is the benefit that could be derived from a \$2 billion investment in health, education and/or public parks, whichever is considered to be the next best alternative for the government.



## Review questions 1.3

1. Define opportunity cost, using the example of a farmer with acreage to illustrate.
2. Explain how the concept of opportunity cost can be used to illustrate how producers will tend to make rational decisions.
3. Discuss how the government faces opportunity costs when deciding to spend taxpayers' money.
4. Discuss the opportunity costs of a young person deciding to discontinue further education after reaching the age of 17.

### Application Exercise 1g

Fill the gaps in the paragraph below:

Economics is all about how people make \_\_\_\_\_ about the use of resources. These decisions must be made because every nation's \_\_\_\_\_ are \_\_\_\_\_ when compared to the demands placed upon those \_\_\_\_\_. This is referred to as the problem of \_\_\_\_\_.

When we decide to use our resources in some way, it necessarily involves us foregoing the \_\_\_\_\_ to use those same \_\_\_\_\_ in some other way. This is because the availability of resources is \_\_\_\_\_ and they have alternative ways of being \_\_\_\_\_. The opportunity \_\_\_\_\_ of decision making can be defined as the \_\_\_\_\_ that could have been gained if the next \_\_\_\_\_ alternative was chosen.

### Application Exercise 1h

Assume that you run a small surf shop selling surf gear and making repairs to boards and equipment. Your electricity bill is quite substantial and you seek ways to reduce it. You discover a device costing \$1,000 that will decrease your electricity bill by \$50 every year. You figure that you could take the money out of your cash balance to purchase the machine and therefore save \$50 per year. Alternatively, you could decide to invest the \$1,000 in a term deposit with a bank, earning 10% per annum. The final alternative is that you could leave the \$1,000 in the business cheque account, where it earns a low 1% interest per annum.



Questions

1. Make a list of the competing uses for the \$1,000.
2. Determine the opportunity cost of purchasing the machine.
3. Assuming that your business does not experience cash flow problems, explain why the business should not leave the cash in the business cheque account. In your answer, refer to opportunity cost.
4. Explain why it might be a rational decision not to purchase the machine. In your answer, refer to opportunity cost.



## 1.4 The production possibility curve and its applications

A production possibility curve (PPC) is also referred to as the **Production Possibility Frontier (PPF)**. It is an abstract tool used by economists to highlight a number of different concepts, including the concepts of scarcity, choice, opportunity cost, underutilisation of resources and efficiency.

The PPC involves a representation of the production alternatives available to an economy producing only two goods or services, in the form of a diagram. While it is not strictly realistic, because all economies can produce more than two goods or services, it does demonstrate some useful points and helps us to make better economic decisions. The PPC relies on a number of simplified assumptions, the key ones being:

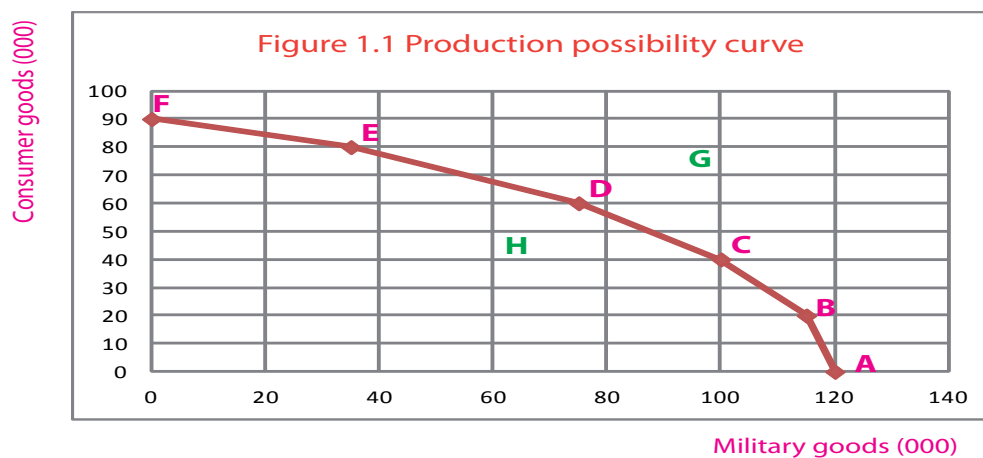
- only two goods (or services) are being produced in an economy;
- all resources or factors of production can be used in the production of either good (or service), and so they are easily able to be swapped between production of the two goods (or services); and
- all resources are fully and efficiently employed.

Assume that an economy can decide to use its resources to produce either military goods, such as tanks and grenades, or consumer goods, such as food and clothing. The production possibilities could be as follows:

Table 1.1

Combination	Military goods (000)	Consumer goods (000)
A	120	0
B	115	20
C	100	40
D	75	60
E	35	80
F	0	90

When we plot this onto a two dimensional diagram we get a production possibility curve (PPC) as follows:



### How the PPC illustrates economic concepts

The way the PPC is drawn clearly highlights the concept of **relative scarcity**. Given that we have limited resources relative to the demands placed on those resources, we must make **choices** about the best way to use our scarce factors of production (such as labour and capital) in the production of goods and services for society. In the above example, our choice is between consumer and military goods - a choice faced by every nation in the world. Which is the best choice is a **normative** consideration that ultimately depends on value judgements. Those countries with valuable natural resources and who also feel under threat from powerful neighbours might prefer to choose production combinations C or B. In contrast, those countries without fear of foreign exploitation or military intervention might prefer production combinations E or F.

A movement from one point to another along a PPC means that a country is allocating more to the production of one good and less to another. In the above example, as the economy produces more military goods it involves a sacrifice in the production of consumer goods, clearly an example of **opportunity cost**. If we assume that the economy was initially operating at point F, producing no military goods and 90,000 consumer goods, then a decision to produce 35,000 military goods will involve an opportunity cost expressed in terms of the production of consumer goods that will be foregone – in this case 10,000 consumer goods.

All points along the curve represent the maximum production possibilities achievable at that particular point in time. Points outside the curve (like point G) are not achievable today, but are achievable in the future through an increase in the quantity or quality of resources. For example, if the nation improves its **productivity** (or **efficiency**), which means that it can produce more of both goods with the same volume of resources, then the whole PPC line will shift out to the right.

Points inside the PPC (like point H) indicate that the economy is not efficiently using its resources in the production of military and consumer goods. In other words, there will be an **underutilisation of resources**, meaning that some available resources are not being fully utilised in production. Better or more efficient use of the nation’s existing resources would therefore increase production. Producing within the PPC is also likely to reflect some unemployment or underemployment of the nation’s resources and every economy is keen to ensure that production occurs on its PPC.

The construction of a PPC is not limited to the production of two goods or services for an economy. It can be used to illustrate the production possibilities available to any economic entity, such as the farmer referred to earlier who can produce either guavas or bananas. Alternatively, it can be used to illustrate the trade-offs/opportunity costs associated with savings and consumption decisions, where the more of our money we devote to consumption, the less we can devote to savings.

### Application Exercise 1i

Using the data in the adjacent table, construct a PPC for health foods and junk foods and answer the questions that follow. You should use grid paper, or some other method to ensure your PPC is accurate.

Combination	Health foods (000)	Junk foods (000)
A	200	0
B	190	40
C	170	80
D	140	120
E	100	160
F	0	200

**Questions**

1. Discuss the implications for the economy if it produces at point F.
2. Discuss the implications for the economy if it produces at point A.
3. Discuss the implications for the economy if it decides to reallocate its resources and move from production point F to D.
4. Identify the opportunity costs associated with a change in production from point A to E.
5. Assume that the economy produces 130,000 items of health food and 100,000 items of junk food. Label this point G on your diagram and discuss its implications.
6. Label a point H on the outside of your PPC diagram and provide two examples of changes that could occur in the economy for this point of production to be achieved in the future.

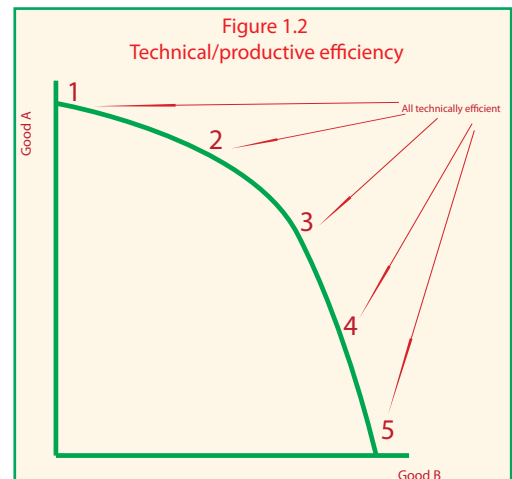
### Efficiency and the PPC

The PPC was used to highlight the opportunity costs associated with the production decisions for an economy. It can also be used to distinguish different types of efficiency that exist in economies. In general terms, **efficiency** refers to the extent to which effort or resources are well used for their intended task or purpose. However, there are two major types of efficiency that help to determine how well an economy is functioning – productive and allocative efficiency.

#### Productive/technical efficiency

Given that the PPC is defined as the maximum production possibilities available when all resources are fully and efficiently employed, by definition, it represents one measure of efficiency – **productive (or technical) efficiency**. Productive (technical) efficiency is defined as that situation where a nation’s resources are producing the maximum amount possible (and at the lowest cost). This type of efficiency means that productivity levels in an economy are at their peak, where productivity is defined as the ratio of output (or production) to the total inputs used in production. In this case, the inputs include our factors of production plus other inputs such as materials.

All points along the PPC are productively efficient. The values society places on the goods in question is irrelevant when the focus is on productive or technical efficiency. So long as production occurs along the PPC, the nation is efficient in a productive sense – it has achieved productive (technical) efficiency. This is highlighted in Figure 1.2.

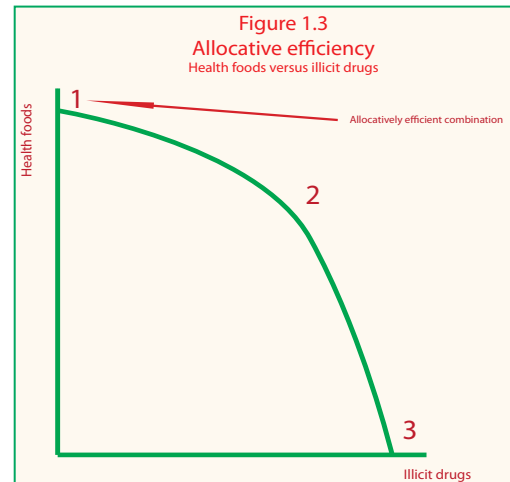


## Allocative efficiency

However, economists are also concerned about a different type of efficiency, **allocative efficiency**, where resources need to be allocated or used in the economy in combinations that provide the maximum possible benefits for consumers and the nation. An economy can have the highest levels of technical (productive) efficiency imaginable – where output is as high as possible, at the lowest cost - but this is of little value if the goods being produced in this economy are either not the goods wanted by society, or goods that are not in society's best interests. To illustrate, assume that an economy can produce health foods or illicit drugs. Its PPC might look something like that highlighted in Figure 1.3.

Despite all combinations of production being technically efficient (i.e. points 1-3), there is only one combination that is in the national best interest. This is point 1. This means that if the economy moved from point 1 towards point 2, it would be allocating fewer resources to the production of health food and more resources to the production of illicit drugs. This would clearly not be in the nation's interests as its welfare or living standards would decline.

The most **efficient allocation of resources** (i.e. allocative efficiency) can therefore be defined as one where all of the nation's resources are being used to produce the best possible combination of goods and services such that national welfare or living standards is maximised. This then implies that any change in the way resources are allocated from this point will result in a deterioration of national living standards.



What is, or isn't, considered to be the most efficient allocation of resources for any particular nation largely depends on the values it places on various goods and services. For example, a nation that is highly materialistic is likely to value the highest possible production levels, regardless of the impact on the environment. Compared to another country that is more environmentally conscious, it will therefore tend to produce more carbon intensive forms of energy (creating greater levels of CO<sub>2</sub> emissions) relative to more environmentally friendly energy production (such as solar or wind energy).

## Review questions 1.4

1. Define production possibility curve (PPC) and list the assumptions underpinning the construction of a PPC.
2. Using Table 1.1, identify the opportunity cost of the nation increasing its production of military goods from 35,000 to 100,000.
3. Using Table 1.1, identify the opportunity cost of the nation increasing its production of consumer goods from 20,000 to 60,000.
4. Discuss the possibility of producing at a point outside the PPC, such as point G in Figure 1.1.
5. Outline the implications for an economy that produces inside the boundary of its PPC, such as point H in Figure 1.1.
6. Explain how the PPC can illustrate the concepts of scarcity, choice, opportunity cost, underutilisation of resources.
7. Define productivity.
8. Define technical (productive) efficiency.
9. Distinguish technical efficiency from allocative efficiency, using a PPC to illustrate.
10. Explain how an improvement in technical efficiency might not be accompanied by an increase in allocative efficiency.
11. Explain what is meant by the most efficient allocation of resources.
12. Discuss why a nation's values determine what it considers to be the most efficient allocation of its resources.

## Application Exercise 1j Efficiency, efficiency, efficiency.....

1. Assume that an economy is achieving technical efficiency and it achieves a boost to productivity as a result of new technology. Explain how this is likely to affect both technical and allocative efficiency. Use a PPC to illustrate.
2. Assume that an economy is not achieving technical efficiency and it achieves a boost to productivity, illustrate how this is likely to affect its PPC.
3. Assume that an economy is achieving technical efficiency. Explain how it could achieve a more efficient allocation of resources without pushing out its PPC.
4. Assume that two countries had exactly the same quality and quantity of resources. Explain why the most efficient allocation of resources as depicted by a point on their respective PPCs is unlikely to be the same.
5. Discuss whether the most efficient allocation of resources, as determined by the 'best' production point on the PPC, is more closely related to normative economics or positive economics.



## 1.5 The basic economic questions

### What and how much to produce?

This is concerned with how we allocate our scarce resources. Should we produce bananas or guavas? Capital goods or consumer goods? Coal fired electricity or solar electricity? Military weapons or better-resourced schools? Once we determine the types of goods and services we will produce, precisely how much should be produced?

Australia has a **market capitalist economy**, with the majority of Australia's resources privately owned and with the allocation of resources being determined primarily by the **market**. This means that the goods and services produced will ultimately be determined by the wants and needs of consumers. Providing businesses can make a profit from producing these goods and services, a market will develop, where **buyers** and **sellers** come together to exchange goods and services at an agreed price. In this context, 'the market' will determine how the nation's resources are allocated in production. In other words, 'the market' will determine what goods and services are produced and in what quantities they will be produced.



It is useful to note at this introductory stage of the course that a market does not involve a single body or authority dictating the process. Instead it involves consumers and producers, guided primarily by self-interest, determining the type and quantity of goods and services to be produced in the economy. [The role and operation of the market in the Australian economy will be explored in Chapter 3.]

While markets play the primary role in determining what is produced, Australian governments ensure that there is some degree of government intervention to protect against the problems inherent with unregulated markets. These 'problems' are commonly referred to as **market failures** and include the under-production of essential services, such as public housing, prisons, schools, hospitals and emergency services, as well as the over-production of undesirable goods and services such as illicit drugs, some weapons, alcohol and tobacco. In this respect, governments will not only influence what goods and services are produced, but how much production will be tolerated in certain instances. For example, the government provides defence and national security services itself because a market would fail to develop for these services. This is because it would be too difficult for producers to extract payment from consumers, resulting in insufficient profit to justify the investment. In other instances, governments allow a market to develop for goods and services, but will be keen to limit the amount of consumption and production that takes place. Common examples include dirty energy (such as coal fired electricity), tobacco, alcohol and gambling services. Governments will use a range of measures to limit the consumption or production of certain goods and services, such as outright prohibition, taxes, regulations and advertising.

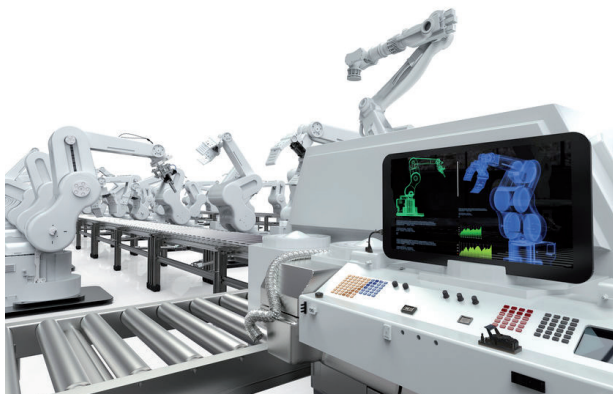
Overall, while governments do play a role, it is the market that ultimately determines what goods and services will be produced and in what quantities. It is therefore consumers who are 'in the driving seat' and experience what is commonly referred to as '**consumer sovereignty**'. This means that consumers primarily determine what will be produced in Australia.

### How to produce?

This is also an allocation question and asks what combination of factors of production will be used to produce goods and services. Do we use more **labour** than **capital** (i.e. more labour intensive forms of production) or more capital than labour (i.e. more capital intensive production methods)?

In Australia, most of the decisions about how goods and services are produced is also determined by the market. A mining company, such as BHP, having already decided that it will produce iron ore, will then need to determine the best mix of resources to use in its drilling and mining operations.

Its decision will be determined by what it considers to be the most cost efficient method of production, which in turn depends upon how efficient or productive each factor of production is relative to its cost. Given the relative difficulty of extracting ore deposits from the earth, mining companies are heavily **capital intensive** – meaning they use mostly



machinery - because it is the most cost efficient and profit maximising method of production. In this respect, the overall cost of labour is too high relative to the cost of capital, resulting in more capital employed relative to labour.

Governments do influence how goods and services are produced to a limited extent. For example, governments provide taxation and other incentives for businesses to spend more on research and development into new technologies and innovation. This helps the business sector to increase efficiency over time and reduces costs for consumers. Governments also influence the cost of labour for businesses by introducing laws that ensure **minimum wages** are paid, occupational health and safety standards are high and equal opportunity and anti-discrimination measures are enforced. In addition, the government has laws in place that restrict the ability or freedom of foreign labour to offer their services in Australia.

### For whom to produce?

This is really concerned with how the goods and services are allocated or distributed to society. If left to free markets, those with greater **economic power** (such as the wealthier members of society) will have greater access to goods and services and some members of society (e.g. those earning minimal incomes) will be unable to purchase some essential goods or services like health care or education. As a consequence, in a free market, only those people with sufficient funds would be able to afford the cost of education for their children. Similarly, some low income earning families would be unable to have access to even basic housing services.



In Australia, it is the market once more that determines who gains access to the majority of goods and services. Income earners in Australia generate the bulk of national income from their contribution to the production of goods and services. Generally speaking, those with higher or unique skills earn bigger incomes and will have the greatest access to goods and services. However, this is influenced by government attempts to achieve a more equitable distribution of income and wealth. These government actions include the implementation of a progressive income tax system that redistributes income to lower income earners, as well as the direct provision of goods and services for lower income groups, such as public housing.

## Review questions 1.5

1. Discuss what is meant by the three basic economic questions facing the Australian economy.
2. Explain how Australia decides 'what' and 'how much' is produced. In your answer, make reference to the role of markets and why government intervention is needed.
3. Explain how Australia decides 'how' goods and services are produced and outline how the government influences how goods and services are produced.
4. Explain how Australia decides who receives the goods and services that are produced and outline how the government influences who gains access to goods and services that are produced.

### Application Exercise 1k

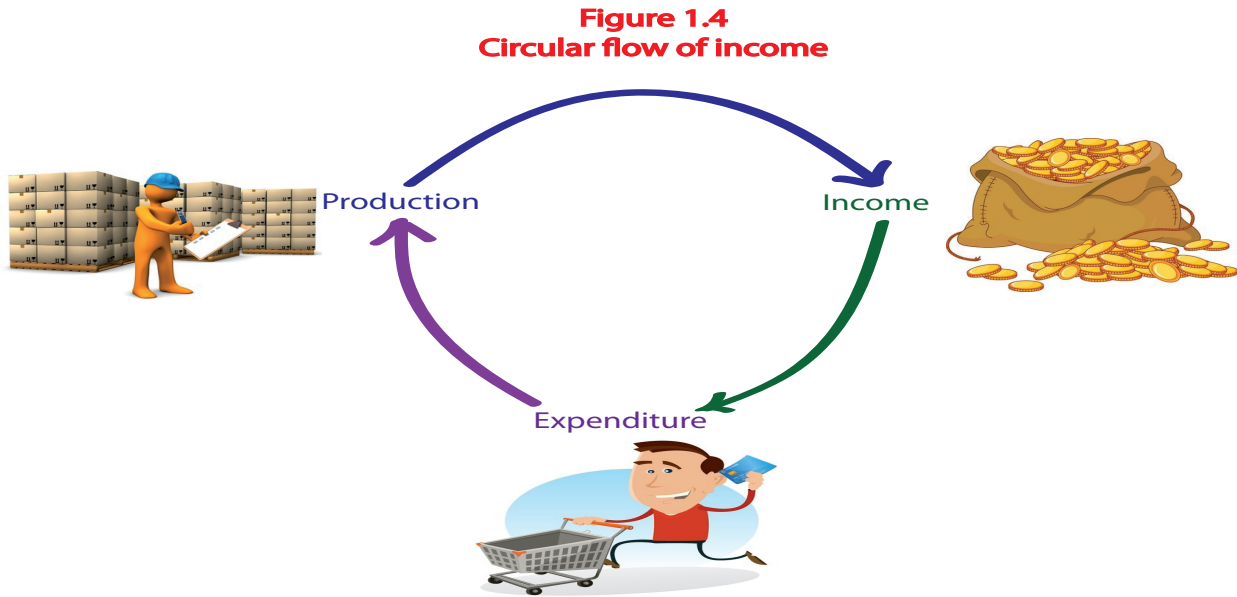
1. Explain how changes in technology have changed 'what' and 'how' goods and services have been produced over the past 10 years. Use at least one example from the Australian economy to illustrate your response.
2. Discuss how the government can reduce the consumption and production of products like alcohol and tobacco.
3. Discuss why and how the government supports the production of certain goods or services. Use at least one example from the Australian economy to illustrate your response.
4. Outline how the Australian government can influence the private sector to employ more labour when producing goods and services.
5. Explain how 'the market' was ultimately responsible for mining companies replacing labour with driverless trains and trucks.
6. Explain how minimum wages laws can affect a firm's decision about how to produce goods and services.
7. Explain how a person earning zero income from wages can still have access to goods and services in the Australian economy.



## 1.6 The purpose of economic activity and the influence on living standards

Earlier we introduced the term ‘economic activity’ in the context of discovering what economics is about. We said that economic activity refers to production, income and expenditure that takes place in an economy. We said that **production** is the process of making a good or services; **income** is the reward given to those involved in the production of goods and services; and **expenditure** is the spending of income on goods and services.

Over time, the total value of production, income and expenditure in an economy should be equal. This should make sense because all of the production taking place is measured in monetary terms and must eventually be returned to factors of production (such as workers and owners) in the form of income. In other words, those who provide the factors of production receive payment for those factors when they are used in the production process. All of this income will then eventually be spent (i.e. expenditure) at some time in the future. This spending will be on various goods and services (i.e. production). This process is often characterised by a **circular flow diagram** as shown in Figure .1.4.



### Economic activity and a two sector circular flow sector model of the economy

The circular flow of production, income and expenditure can also be demonstrated by including the two key sectors in the economy that are responsible for economic activity - the **business sector** and the **household sector**. This is shown in Figure 1.5 below.

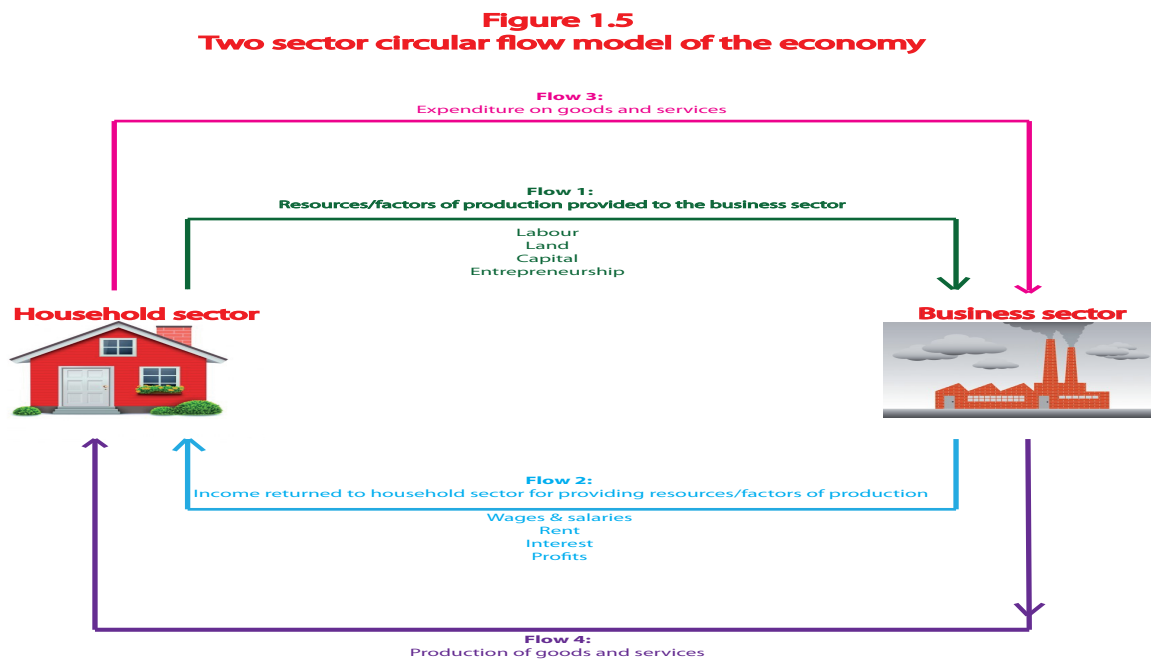


Figure 1.5 shows that the flows of production, income and expenditure occur as a result of transactions between the business and household sectors. The household sector provides the business sector with resources (such as labour) and

this is highlighted by **Flow 1** in the diagram. In return, the business sector provides the household sector with income (such as wages), which is highlighted by **Flow 2**. This income is then spent by the household sector on the purchase of goods and services (i.e. expenditure), which forms **Flow 3** and this expenditure necessarily results in the production of goods and services by the business sector, which is highlighted in **Flow 4**.

While this simple model ignores other important sectors (e.g. the government and external sectors) and flows (e.g. the possibility of savings and taxes) it remains useful because it helps us to gain a better understanding of the core influences affecting economic activity. For example, it should be obvious that any decision by the household sector to contribute more resources to the business sector (e.g. providing more labour) will ultimately result in more income, expenditure and production (i.e. economic activity) taking place in the economy. This boost in economic activity is therefore heavily linked to the desire of the household sector (individuals and families) to improve their standard of living.

## Economic activity and living standards

Ultimately, economic activity takes place because it helps to improve our individual and collective **standards of living**, both in **material** and **non-material** terms. This means that most people are keen to improve their enjoyment and quality of life over time, which usually takes the form of them being more able to purchase goods and services. In this respect, there is typically a positive correlation between economic activity and living standards, such that an increase in economic activity leads to an increase in living standards. This is because the earning of income leads to expenditure on goods and services that provides people with additional satisfaction. However, living standards are not only related to the ability to consume goods and services and will depend on both material and non-material factors that determine our overall living standards.

### Material living standards

Australian governments are keen to stimulate growth in production as measured by growth in **real gross domestic product**, or real GDP, over time. [Real GDP will be covered more fully in Unit 2 but at this stage simply remember that it is the main statistical measure of production.] Growth in real GDP is also referred to as **economic growth** and it means that there has been an increase in the real values of production, income and expenditure from one period to another. Any increase in real GDP or economic activity will help to raise material living standards, on average, for Australian households. Higher production levels lead to more incomes and/or employment, enabling households to purchase more goods and services, thereby increasing their material prosperity. This is referred to as an increase in **material living standards**, and is most commonly measured by increases in **real GDP per capita**. [Real GDP per capita will also be covered in Unit 2.]

### Study tip

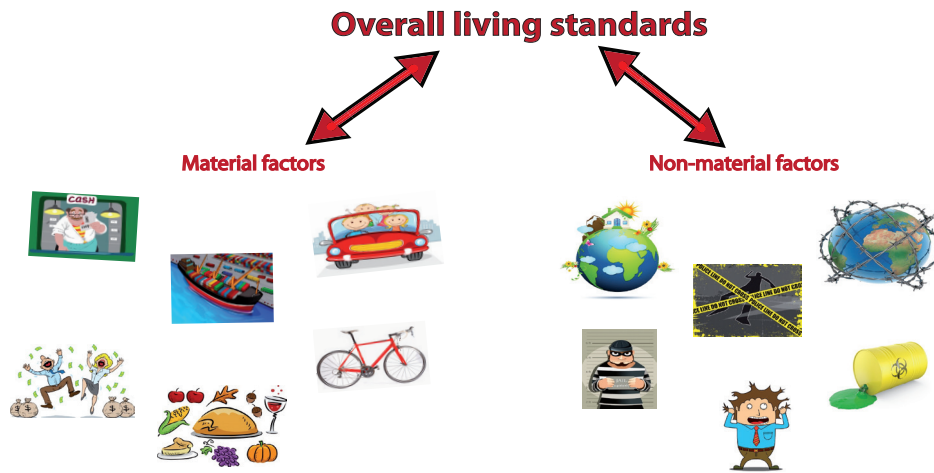
*The term 'real' in real GDP means that the impact of inflation or rising prices has been removed from the calculation of GDP. This ensures that any growth in the value of (real) GDP has occurred because there has been a genuine increase in production (or economic activity) rather than an increase caused by higher prices.*

### Non-material living standards

Clearly, there is more to our living standards than the ability to purchase goods and services. In other words, there exists a wide range of factors that influence our well-being beyond our ability to purchase a newer car or house, more fashionable clothes, or the latest technological gadgetry. These influences are often referred to as 'non-material' or 'quality of life' factors that impact on our overall living standards. These include the following types of factors:

- Access to clean air, water and other natural resources
- Access to health and education services
- Congestion or pollution levels
- Depletion of resources
- Exposure to crime
- Job satisfaction levels
- Leisure time
- Stress levels
- Life expectancy
- Freedom of expression
- Income and wealth inequality
- General happiness levels
- Quality of goods and services available
- Levels of gender equality
- Lack of social conflict.

Some of the factors above relate to the non-material benefits attached to any growth in economic activity, such as the satisfaction gained from employment or the reduced stress levels associated with earning an income and building a stockpile of wealth. However, a number of the factors on the list are non-material costs associated with economic growth. This includes congestion, pollution and depletion of resources. The benefits of economic growth will always need to be weighed up against the costs of economic growth when determining the overall impact on living standards. Government policies that seek to take into account the changes to **overall living standards** will be explored more fully in Unit 2. But first, it will be useful to first examine the nature of both 'trade-offs' as well as cost-benefit analysis.



## Review questions 1.6

1. Outline the relationship between production, income and expenditure using figure 1.4 to illustrate your response.
2. Refer to Figure 1.5 and describe the flows that represent economic activity.
3. Explain a factor that could contribute to a rise in economic activity. Use the two sector model to illustrate.
4. Describe the general link between economic activity and living standards.
5. Distinguish between the material and the non-material factors that impact on living standards.
6. Identify two separate factors that could contribute to growth in material living standards.
7. Identify two separate factors that could contribute to growth in non-material living standards.
8. Discuss whether an increase in economic activity will lead to an increase in overall living standards.

## 1.7 The need for trade-offs and cost-benefit analysis

As economic agents, any decision we make will typically be made with a view to maximising our satisfaction, and these decisions will always involve **trade-offs**. This means that to gain something of value with our time or money, we necessarily forego the opportunity to do a range of other things with that time or money. For example, a decision to spend \$1,000 on jewellery involves trade-offs in terms of what we could have been purchased with that \$1,000, such as purchasing a holiday, a new smartphone, or donating the money to charity. Alternatively, a decision to spend excessively long hours at work might involve a trade-off in terms of one's health in the long term. These trade-offs are necessary because, to varying degrees, we have a finite amount of money to spend (or resources to use) and an infinite number of uses for that money (or resources). This is of course tied to the core problem of **relative scarcity** and **opportunity costs** that we examined at the start of this text: our resources are scarce relative to the unlimited demands placed upon those resources. It therefore begs the question: 'what is the difference between trade-offs and opportunity costs?'

Relative scarcity will necessarily result in one or more trade-offs being made, such as the holiday, the smartphone or the donation being traded-off for the purchase of the jewellery worth \$1,000. However, the existence of the trade-offs creates an opportunity cost that is quite unique in terms of the value of the next best alternative that has been foregone. For example, if your next best choice was a \$1,000 donation to charity, then this becomes the opportunity cost, despite it being one of three things being traded-off when purchasing jewellery. Accordingly, opportunity cost is more specific, narrowing the focus to only one of the trade-offs: the trade-off that was considered to be most valuable and therefore most difficult to forego.



There are numerous examples of specific trade-offs that are made at both a **microeconomic** level and a **macroeconomic** level. For example, trade-offs experienced at the microeconomic level might include:



- The trade-off between spending and saving
- The trade-off between work and leisure.

Trade-offs experienced at the macroeconomic level might include:

- The trade-off between economic growth and the environment
- The trade-off between efficiency and equity.

[A closer analysis of the macroeconomic trade-offs will occur later in the text when covering Unit 2.]

The two trade-offs we will look at in closer detail are relatively general in nature and can be examined at both a microeconomic and macroeconomic level. These are the trade-offs between the **current and the future** as well as the trade-off between the **long run and the short run**.

### Current versus future trade-offs

This is perhaps the most common form of trade-off experienced by economic agents. Given that time is arguably endless, and most of us live for a relatively long period of time, our economic decisions will need to balance our current needs against our future needs. In simple terms, trading-off **current consumption** for **future consumption** means that our living standards will be lower today and higher in the future. This type of trade-off will typically involve **saving** more of our current day income for use in the future. It is effectively transferring consumption through time, from today to some future date. Conversely, any decision to **borrow** money today to support current consumption involves trading-off future consumption. In this case, it is once again transferring consumption through time, but this time from the future to today.

The trade-offs and opportunity costs associated with delaying or not delaying current consumption will vary over a person's lifecycle. Generally, as we age, we are more likely to have responsibilities and be closer to retirement. As a consequence, our willingness to think about the future increases and it becomes much easier to trade-off current consumption for future consumption. This contrasts with young people, who are generally less concerned about the future and find it more difficult to envisage retirement. This means that the opportunity costs for older people of delaying consumption will be lower compared to younger people, who are not only less willing, but less able to save for the future.

The trade-off between current and future is also one that is regularly faced by businesses and governments. The end of the **mining boom** in Australia over recent years saw mining companies slow down the rate of spending on capital equipment and productive capacity and instead focus on saving some of the gains that were earned during the boom years. They decided that continued spending and expansion today would ultimately result in excess capacity in the future. In contrast, when the mining boom was at its peak, with very high prices being received for Australian minerals, companies decided to spend heavily on capital expansion (e.g. expanding mine capacity) in order to take advantage of the growing demand that was expected to continue into the future.



With respect to governments, their decisions constantly balance the needs of the future with the demands of the present. Currently, this is particularly evident given our **ageing population** and the negative impact this is expected to have on our future living standards. With an increasing proportion of the Australian population nearing retirement age, the large exit of workers from the labour force will cause the rate of growth in economic activity (i.e. economic growth) to slow and government expenditure to rise (as more retirees will require the aged pension and health care costs will accelerate). This will have major negative implications for the government's finances (i.e. its budget position) in the future, with income from taxes expected to fall and expenditure on health and welfare expected to rise. Without acting today to protect against the possibility of a much higher budget deficit (government spending exceeding income), future generations of Australians will be forced to face the burden of supporting older Australians. In essence, failure to act today means that we would be trading-off future prosperity for current consumption.

As a consequence of the need to trade-off the current for the future, recent governments have developed policies that seek to address the trade-off. This includes measures to expand the size of the future population, by encouraging a higher birth rate and immigration of younger persons, as well as efforts to reduce the budget deficit and return the budget to surplus in the medium term.

### Study tip

*Microeconomics focuses on the decision making or performance within specific areas or sectors of the economy. The analysis is 'micro' in nature, meaning that it involves an examination of the smaller parts that make up the entire economy, such as the spending or production decisions within households, or specific businesses. In contrast, macroeconomics relates to aspects or performance of the entire economy that are 'macro' in nature. For example, national production, income and expenditure are macroeconomic terms because they relate to activity of the entire economy, and not activity within specific sectors or sections of the economy.*

## Application Exercise 11: Consume now or save for the future?

Income that we earn can either be consumed (i.e. spent on consumption goods and services) or saved (e.g. deposited in the bank). Given that savings should accumulate (and become wealth), they will eventually be spent some time in the future. In this respect, savings represent future consumption or 'deferred' consumption. This means that any given level of income today can either be spent on current or future consumption. It is in this respect that saving money is often referred to as 'an investment' - because it results in future benefits for the saver. Accordingly, the more of our income that is devoted to current consumption, the less that is devoted to future consumption and vice versa. This means that our decision to consume or save necessarily involves a **trade-off**. To become wealthier in the future we need to trade-off current consumption in order to create room for savings, which can then be invested for wealth creation. Overall, if we 'party' too hard today, we may have less opportunity to 'party' tomorrow, and if we prepare too much for tomorrow, we may not enjoy today as much as we could. The trade-off between current and future consumption (or consumption and savings) is clearly a personal choice and ultimately depends on one's ability or willingness to think beyond the short term.



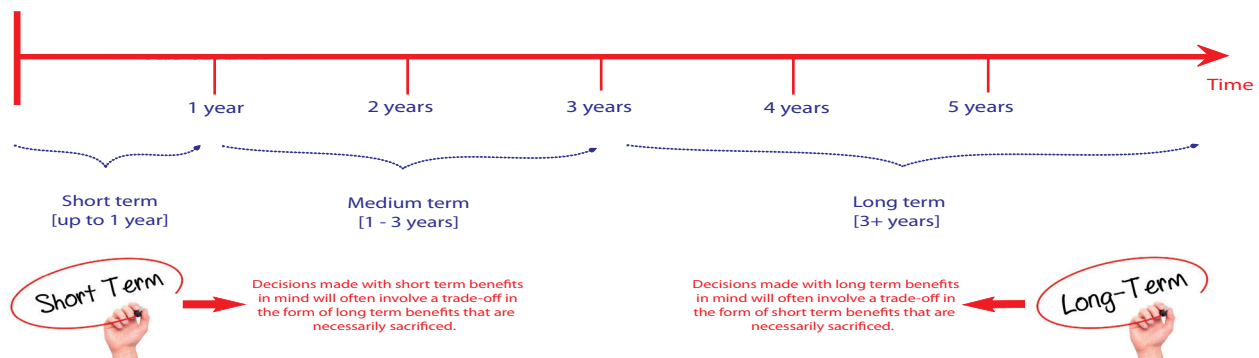
### Questions

1. Explain why savings is also referred to as 'deferred' or 'future' consumption.
2. Discuss how a decision to save more today involves a trade-off.
3. Discuss how a decision to save less today will impact on your living standards over time.
4. Outline two ways that a person can increase their wealth over time.
5. Discuss what is meant by the expression: if we 'party' too hard today, we may have less opportunity to 'party' tomorrow.

### Short run versus long run trade-offs

Trading off the **short run** for the **long run** is very similar to trading off the current for the future. Similarly, trading off the long run for the short run is very similar to trading off the future for the current. But what is the short run compared to the long run? The distinction between the two is not always clear cut. In general usage, the short run typically refers to a period of time that is close enough to heavily influence decision making today, whereas the long run is that period of time that is far enough away to have a smaller influence on today's decision making. The short run is therefore loosely defined as the next six months to a year whereas the long run is a period beyond one year. Often, the future time horizon is broken up into the short term (short run), medium term and long term (long run), as depicted in Figure 1.6 below.

**Figure 1.6**  
A general guide:  
short term vs long term



As a general rule, decisions made with short term benefits in mind will often involve a trade-off in the form of long term benefits that are necessarily sacrificed. For example, a decision by a young person to leave school and commence work before completing year 12 is often made with short term benefits in mind, such as earning income to achieve a better quality of life. However, this involves trade-offs in terms of the long term benefits that could have been provided by further education, such as a higher income earning capacity in the future and the possible prestige attached to a tertiary qualification. Similarly, decisions made with long term benefits in mind will often involve trade-offs in the form of short term benefits that are necessarily sacrificed. For example, a decision by a household to invest \$20,000 installing a renewable energy system at home (e.g. solar panels) is made with long term benefits in mind (e.g. cheaper energy bills in the future). However, it involves trading off the short term gains that could have been enjoyed by using that \$20,000 on a new car or family holiday.

It is important to note that the time line shown in Figure 1.6 is a only a general guide. There is by no means agreement about how time is broken up into the short and long run. It will mostly depend upon the individuals or groups making

economic decisions. Businesses, for example, will typically consider the short run to be that period of time where they are unable to expand capacity. [In Economics, we refer to this as that period of time where the factors of production are fixed.] For example, a business might experience what appears to be a permanent surge in the demand for its products. Its ability to increase output (i.e. make more products) will be limited by the size of its operation (i.e. its productive capacity). In the short run, it is unable to increase the size of its operation (e.g. build a bigger factory) because its capital factors of production (e.g. the factory and the machinery) are fixed for a certain period of time. In contrast, the long run is that period of time where all factors of production are not fixed. In other words, all factors of production are variable and the business is better able to respond to changing market conditions. In this context, the decision by a business not to expand its capacity today (e.g. by investing in new plant and equipment) will mean that it is effectively focussing on short run benefits (e.g. protecting its bank balance or keeping debt levels low) and trading off the potential long run benefits that come from having a bigger operation that can better respond to growing demand for its products in the future.

Some further examples of short and long run trade-offs include:

- The government controlling our natural resources via the granting of licences (e.g. in the logging and fishing industries) to balance the short term needs of the population with the need to ensure that we have guaranteed supply in the long term.
- Pursuit of economic growth to satisfy our short term needs which comes at the expense of the environment in the long term (e.g. carbon pollution and climate change).
- Government efforts to stimulate the economy in order to create jobs in the short term can come at the expense of higher rates of inflation (i.e. higher prices) in the long term.

### Study tip

*The distinction between the short and long run is also often used in the context of macroeconomics [see the distinction between macro and microeconomics in the previous Study Tip]. For example, many economists would consider that the short run is characterised by that period of time in which prices and wages are relatively 'sticky' (or inflexible) and the long run as that period where economic variables (like wages and prices) have time to adjust to new economic conditions. Other economists would argue that the short and long run distinction depends on the time it takes before government policy actions have minimal effect on real values in the economy. These economists would therefore argue that short run attempts to stimulate economic activity will only result in inflation in the long run, with no change in real output or activity. However, these types of considerations are beyond the scope of the Unit 1 and 2 course.*

These will be explored more fully when we cover Unit 2 later in the text.

## Cost-benefit analysis

The need for trade-offs between the **current** and **future**, or between the **short run** and **long run**, will often involve the need for a **cost-benefit analysis** to help determine the best trade-offs to make - one that minimises the opportunity cost associated with any given decision.

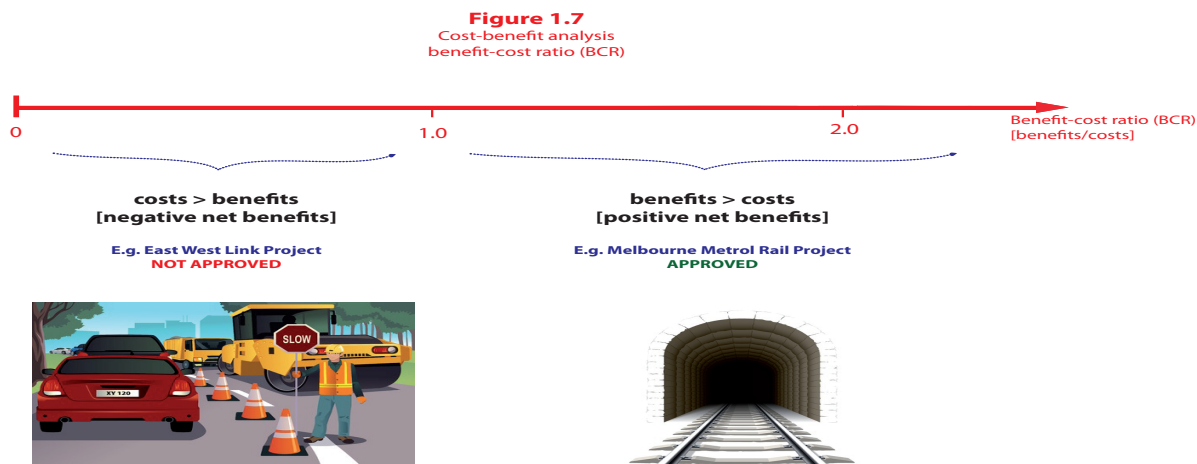
A cost-benefit analysis is a comparison of the expected costs and the expected benefits of a particular course of action or project. Most of us will conduct a simple cost-benefit analysis whenever we make a decision about how to spend our time or money. This is usually completed in our minds, without the use of technology or other tools, and includes everyday decisions such as whether to attend school, whether to smoke cigarettes or drink alcohol, or whether to indulge in excessive consumption of fatty foods. Clearly, these types of decisions necessarily involve weighing up whether the benefits of a particular course of action outweigh the costs. In the case of cigarettes for example, consumption today will provide benefits in the short term (e.g. relieving stress or looking 'cool') but will ultimately be outweighed by long term costs in the form of poor health. Many people will be able to make this determination without any complex calculations or detailed analysis, choosing to refrain from cigarette consumption as the widely known evidence points to it being extremely damaging to the long term health of smokers.

More complex cost-benefit analyses are undertaken by governments (and businesses) before a decision is made on whether to proceed with a major project (such as the construction of a new road or railway) or invest the funds in some other activity. The cost-benefit analysis will generally become a key component of 'the business case' put forward by the government and will often take a considerable period of time to prepare, involving the expert input of numerous professionals, including accountants, economists, actuaries, and other finance professionals. All of the **benefits** and **costs** will typically be listed in a common unit of measurement (i.e. money), with future costs/benefits valued in current dollar terms to remove the effects of inflation (or higher prices). Once the experts have itemised all costs and benefits in current dollar terms, the project will only become viable if the benefits outweigh the costs (i.e. the **net benefits** are positive and not negative).



It is also common to refer to this measure as a '**benefit-cost ratio**' (benefits divided by costs). In a benefit-cost ratio, a ratio greater than 1.0 indicates that a project's benefits outweighs the costs, whereas a ratio of less than 1.0 indicates that the costs outweigh the benefits. See Figure 1.7 below for further clarification.

There have been numerous examples of cost-benefit analyses being conducted by governments and other groups over recent years. Arguably the two highest profile projects have been the Melbourne Metrol Rail Project and the abandoned East West Link Project. The benefit-cost ratio (BCR) for the Melbourne Metrol Rail Project was in excess of 1.0, suggesting that the expected benefits outweighed the costs, and the project was approved. However, the East West Link Project's BCR was less than one and the project did not proceed.



Given that many costs and benefits are non-monetary in nature, it can be a subjective exercise converting these into monetary values for the purposes of a cost-benefit analysis. For example, the failed proposal to build the East-West Road Link (connecting the Eastern Freeway to the Western Ring Rd) needed to take into account the loss of some public parkland (i.e. parts of Royal Park). Clearly, the loss of parkland will be a bigger loss to some compared to others and the measurement of this 'cost' in the cost-benefit analysis is highly subjective. Despite this, organisations and governments continue to see the value in conducting cost-benefit analyses to minimise the opportunity costs of major economic decisions and ensure that the most efficient allocation of resources is achieved (e.g. allocative efficiency).

## Review questions 1.7

1. Outline the relationship between trade-offs and opportunity cost.
2. Explain why trade-offs are necessary. In your answer refer to scarcity.
3. Distinguish microeconomics from macroeconomics.
4. Identify one example of a microeconomic trade-off
5. Identify one example of a macroeconomic trade-off
6. Explain what is meant by 'trading off current consumption for future consumption'.
7. Explain what is meant by 'trading off future consumption for current consumption'.
8. Outline why it is easier for an older person to trade-off current consumption for future consumption compared to a younger person.
9. Describe how mining companies might make a trade-off between current and future spending.
10. Explain how an ageing population has forced the government to make a trade-off between current and future spending.
11. Explain what is meant by the trade-off between the short run and the long run. Use an example to illustrate.
12. Define 'cost-benefit analysis' and discuss how a cost-benefit analysis is related to trade-offs and opportunity costs.
13. Briefly outline how a cost-benefit analysis is undertaken.
14. Define 'benefit-cost ratio' (BCR) and explain the implications of a BCR on a project being less than 1.
15. Describe why the state government of Victoria decided to proceed with the Melbourne Metrol Rail Project and abandon the East West Link Project. In your answer, refer to the respective BCRs of the projects.
16. Explain why some of the costs and benefits contained in a cost-benefit analysis are subjective in nature.

## Application Exercise 1m: Cost-benefit analysis

Assume that you are on the Student Representative Council at your school and the Principal has invited you to join a Committee investigating the feasibility of constructing a new gymnasium at the school. It is expected that \$5 million is needed to build the gymnasium, with the funds coming from a combination of higher school fees (or increased payments from parents) and borrowing from a financial institution. You have been assigned the task of conducting a cost-benefit analysis to determine if the project should go ahead.



### Questions/tasks

1. Explain how the construction of the gym highlights the following trade-offs:
  - Current versus future
  - Short run versus long run
2. Compile a list of benefits of building the gym and attempt to place a monetary value on each benefit.
3. Compile a list of costs of building the gym and attempt to place a monetary value on each cost.
4. Calculate a benefit-cost ratio (BCR) and outline what this number represents.
5. Prepare a brief report detailing whether the construction of the gymnasium should (or should not) proceed. Make reference to the BCR in your report.

## 1.8 Multiple choice review questions

1. Which of the following is not regarded as being a 'factor of production'?
  - a) money
  - b) machinery
  - c) land
  - d) workers
2. The opportunity cost of producing a given product is:
  - a) the price of the product
  - b) the best alternative product that could have been purchased
  - c) the price paid for the resources used in the production of the product
  - d) the value of the best foregone alternative which the resources used in its production could have produced
3. Economics can be best defined as the study of
  - a) resource allocation in a market capitalist economy
  - b) how scarce resources are allocated in an economy by the public and private sectors
  - c) how government, households and firms influence business decision making
  - d) how limited wants affect an abundance of resources
4. Which of the following is not regarded as a key factor describing economic activity in Australia?
  - a) Governments
  - b) Production
  - c) Income
  - d) Expenditure
5. A business has narrowed down the most viable investment options to (1) the construction of a new mine costing \$100 million and (2) the purchase of a \$100 million shareholding in a foreign mining firm. The opportunity cost associated with the construction of a new mine is which of the following?
  - a) the \$100 million spent on the construction of the mine
  - b) the benefits that would have been provided by the \$100m shareholding
  - c) the dividends (share of profits) that would have been generated from the \$100m shareholding
  - d) unknown since insufficient information is given
6. With respect to the production possibility curve, which of the following statements is false?
  - a) a movement along the curve, from one point to another, is related to opportunity cost
  - b) unemployment is likely to occur when the economy is producing inside the curve
  - c) it is not possible to produce at a point outside the curve (i.e. beyond the frontier)
  - d) at any point in time, an economy cannot possibly produce at two different points along the curve

7. Which of the following is not one of the basic economic questions faced by Australia?
- What to produce
  - When to produce
  - For whom to produce
  - How to produce
8. If a technically productive nation further improves efficiency via the introduction of new technology, then the change may be illustrated graphically by
- a movement along the production possibility curve
  - a shift outwards of the production possibility curve
  - a shift inwards of the production possibility curve
  - a shift towards the production possibility curve
9. With respect to the distinction between normative and positive economics, which of the following is most likely to be a normative statement?
- Spending on education is more important than spending on science and technology
  - An increase in personal tax rates will tend to reduce expenditure by households
  - An ageing population will increase health costs in the future
  - Payment of school fees is an example of expenditure in an economy
10. Assume that we have the production possibilities shown in the table below:

Combination	Military goods (000)	Consumer goods (000)
A	120	0
B	115	20
C	100	40
D	75	60
E	35	80
F	0	90

The opportunity cost of producing 40,000 consumer goods is:

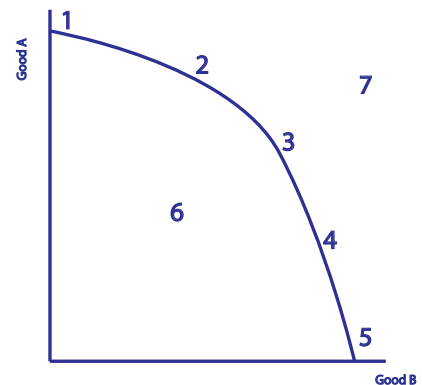
- 120,000 military goods
  - 20,000 military goods
  - 115,000 military goods
  - 100,000 military goods
11. In relation to the two sector flow model of the economy, which statement is incorrect?
- Wages flow from the Business sector to the Household sector
  - Resources flow from the Business sector to the Household sector
  - Expenditure flows from the Household sector to the Business Sector
  - Production of goods and services flows from the Business Sector to the Household sector
12. In Australia, resources are allocated by
- consumers and their demand for factors of production
  - producers and their demands for scarce resources
  - 'the market' primarily, with some government intervention (or planning)
  - government decision making, with a limited role for 'the market'
13. Which of the following is most likely to increase material living standards?
- Increased levels of production
  - Increased freedom of expression
  - Reduced levels of stress
  - Increased leisure time
14. The need for trade-offs in economics is closely related to which of the following?
- The concept of opportunity cost
  - How to produce goods and services
  - Non-material living standards
  - The circular flow of income

**15. Relative scarcity in economics means that**

- a) The demands placed upon resources are very high
- b) The demands placed upon resources are excessive when compared to the availability of those resources
- c) Resources available for use in production are limited
- d) Economies experience shortages of all factors of production

**16. In relation to the Production Possibility Curve (or frontier) to the right, which of the following statements is correct?**

- a) Points 1 to 5 represents production combinations where productive efficiency is being achieved
- b) A movement from point 1 to 4 means that the economy will be producing a combination of goods and services that better satisfies society
- c) Point 6 represents a production combination where allocative efficiency is being achieved
- d) A movement from point 5 to 3 means that fewer resources will be allocated to the production of Good A

**17. Which of the following is least likely to push the PPC outwards in Australia?**

- a) An increase in productivity
- b) A discovery of iron ore deposits
- c) Investment in a super fast broadband network
- d) A large decrease in the number of skilled migrants to Australia

**18. Which of the following is incorrect in relation to the benefit-cost ratio (BCR)?**

- a) A BCR greater than one suggests that the net benefits of a project are positive
- b) A BCR less than one suggests that the costs of a project outweigh the benefits
- c) A BCR for a project that is too high suggests that a project is likely to be rejected
- d) A BCR is calculated by dividing the benefits of a project by the costs

**19. Which of the following factors about a cost-benefit analysis is incorrect?**

- a) A cost-benefit analysis is usually subjective which reduces the value of a cost-benefit analysis
- b) A cost-benefit analysis helps businesses and government achieve a more efficient allocation of resources
- c) A cost-benefit analysis will usually be done using a common unit of measurement (e.g. money)
- d) A cost-benefit analysis is typically completed for major government projects that are planned for the future

**20. Which of the following is not a return to the Household sector for their contribution to production?**

- a) wages
- b) expenditure
- c) profits
- d) interest

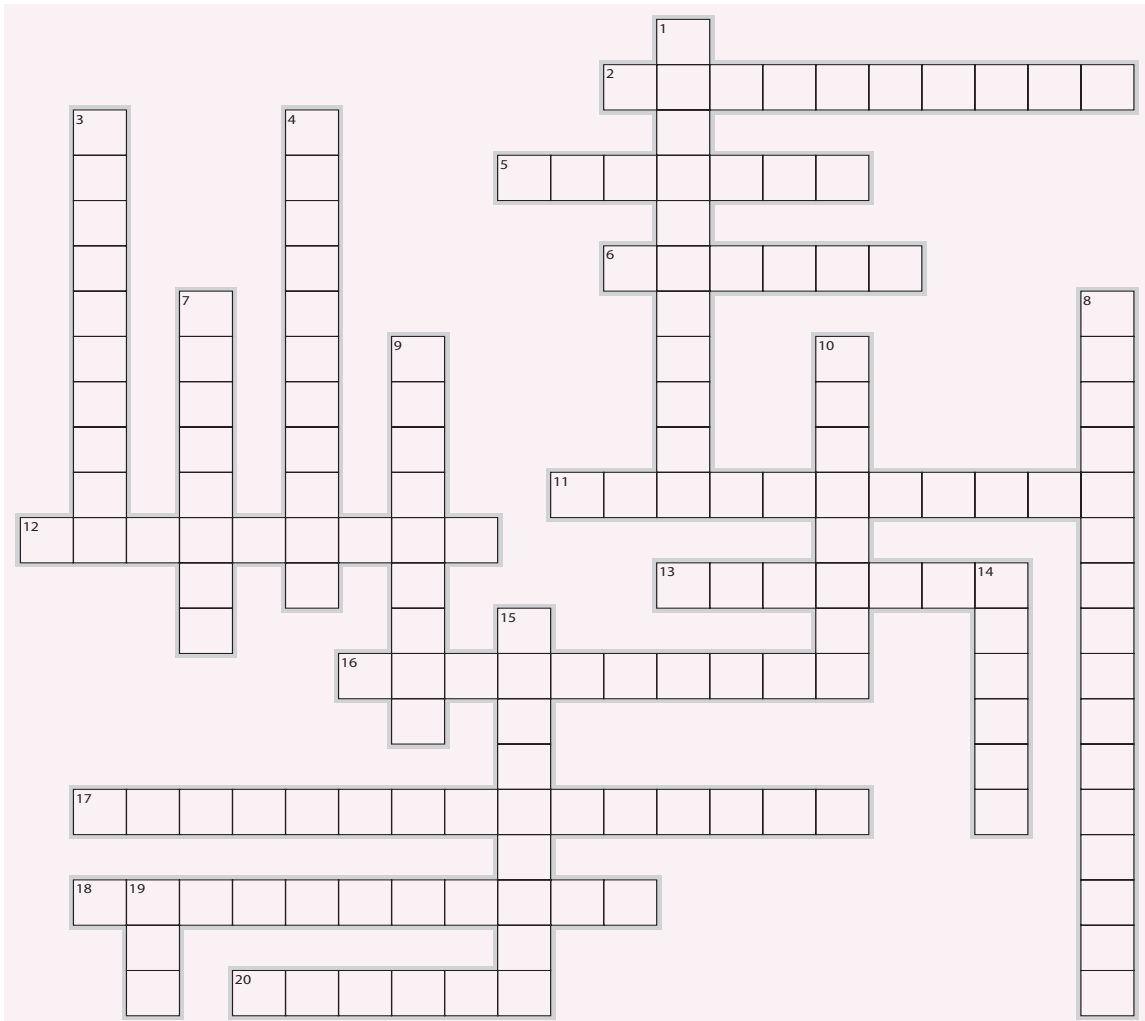
## 1.9 Chapter crossword puzzle

**Across**

- 2. The process whereby goods and services are made and also refers to the total amount of goods and services that have been made over a period
- 5. Any place or region around the world where production of goods and services takes place
- 6. This primarily determines how resources are allocated in Australia
- 11. When this ratio is above one it suggests that a project's benefits outweigh its costs (2 words)
- 12. Factors of production, such as labour and capital
- 13. Resources that have been made by combining labour and natural resources to create a more sophisticated input in the production process
- 16. The type of efficiency where the resources are allocated in combinations that create the maximum possible benefits for the nation
- 17. This is made up of both material and non-material factors that impact on our quality of life (2 words)
- 18. This is a cost that is measured in terms of the benefit foregone (or sacrificed)
- 20. Money received by those involved in the production of goods and services, such as wages

**Down**

1. The exchange of money or something else of value for something in return
3. The type of efficiency where a nation's resources are producing the maximum amount possible (and at the lowest cost)
4. Spending of income on goods and services
7. This is related to opportunity cost and refers to something being sacrificed when a choice is made (2 words)
8. Unlimited wants compared to limited resources (or money) that are used to satisfy these wants (2 words)
9. A part of the private sector that is not part of the business sector
10. Those economic statements that can be verified or tested to be either true or false
14. The reward for this factor of production is most commonly wages
15. Economic statements or claims that are based on opinion or value judgements
19. The acronym used to represent the production alternatives available to an economy



**1.10 Chapter summary**

1. An economy exists in any place or region around the world where production of goods and services takes place, expenditure on those goods and services occurs and income is made from the selling of those goods and services.
2. Economics primarily concerns why and how individuals or groups make decisions about the transactions they will undertake on a daily basis.
3. Fact based economic statements come under the banner of positive economics and they can be verified or tested to be either true or false. In contrast, statements or claims that are based on opinion or value judgements come under the banner of normative economics.
4. Relative scarcity is the core problem determining decision making in every economy around the world. It is defined as the wants and needs of societies being larger than the resources available to satisfy those wants and needs. This creates the need to make economic decisions and choices.
5. The needs of individuals or households in societies can be defined as the basic goods and services that are necessary for survival.
6. Resources are those things that are used to produce goods and services and are also referred to as 'factors of production'. Land or natural resources are all those resources that occur in nature. Labour refers to the mental and physical effort by humans in the production process. Capital refers to those resources that have been made



by combining labour and natural resources to create a more sophisticated input in the production process. Entrepreneurship (or enterprise) refers to the skills of those individuals who combine our resources to produce goods and services.

7. The producers involved in decision making face the problem of relative scarcity by determining the best way to combine resources in order to best satisfy consumers and therefore make the most profit. Income earners face the problem of relative scarcity when they determine how best to use their income earning capacity, or their skills and labour, in order to derive the best possible outcome. Consumers face the problem of relative scarcity when they make decisions about how to turn their income or wealth into the satisfaction provided by spending or consumption.
8. Opportunity cost is the benefit foregone (or sacrificed) when choosing one alternative over others and is measured by the value of using the resources in their next best alternative use.
9. All rational economic agents will seek to minimise their opportunity costs when making decisions or undertaking economic transactions.
10. The Production Possibility Curve (PPC) is an abstract tool used by economists to highlight a number of different concepts, including the concept of opportunity cost. It involves a diagrammatic representation of the production alternatives available to an economy producing only two goods or services.
11. A movement from one point to another along the PPC means a country is allocating more to the production of one good and less to another. All points along the curve represent the maximum production possibilities achievable at that particular point in time. Points inside the PPC reflect that the economy is not using its resources efficiently and there is an underutilisation of resources.
12. Technical (productive) efficiency is defined as that situation where a nation's resources are producing the maximum amount possible (and at the lowest cost).
13. Allocative efficiency occurs when resources are allocated in combinations that derive the maximum possible benefits for consumers and the nation.
14. The most efficient allocation of resources occurs when all of the nation's resources are being used to produce the best possible combination of goods and services such that national welfare or living standards is maximised.
15. If 'the market' determines how the nation's resources are allocated, then consumers and producers, guided primarily by self-interest, determine what goods and services will be produced, how these goods are produced and who gains access to or enjoyment of these goods and services.
16. No country allows 'the market' to solely determine the allocation of resources because markets fail in many instances. This means that markets, left unregulated or without any form of government intervention, will lead to an undesirable (or inefficient) allocation of resources.
17. Australia has a market capitalist economy, with approximately 80% of Australia's resources privately owned and with the allocation of Australian resources being determined primarily by the market.
18. In Australia, a combination of government decision making and 'markets' will answer the basic economic questions of what to produce, how to produce and for whom to produce.
19. Economic activity in Australia, characterised by the production, income and expenditure taking place in the Australian economy, is undertaken or influenced by individuals or groups operating within either the public or private sector.
20. Economic activity takes place because it helps to improve our individual and collective standards of living, both in material and non-material terms.
21. Australian governments are keen to stimulate growth in production as measured by growth in real gross domestic product, or real GDP, over time.
22. There is more to our living standards than the ability to purchase goods and services. In other words, there exists a wide range of factors that influence our well-being beyond our ability to purchase goods and services (e.g. access to clean air and leisure time).
23. As economic agents, any decision we make will typically be made with a view to maximising our satisfaction and these decisions will always involve trade-offs.
24. Our economic decisions will need to balance our current needs against our future needs.
25. Trading off the short run for the long run is very similar to trading off the current for the future. Similarly, trading off the long run for the short run is very similar to trading off the future for the current.
26. As a general rule, decisions made with short term benefits in mind will often involve a trade-off in the form of long term benefits that are necessarily sacrificed.
27. A cost-benefit analysis is a comparison of the expected costs and the expected benefits of a particular course of action or project. All of the benefits and costs will typically be listed in a common unit of measurement (i.e. money), with future costs/benefits valued in current dollar terms to remove effects of inflation (or higher prices).
28. In a benefit-cost ratio, a ratio greater than 1.0 indicates that a project's benefits outweighs the costs, whereas a ratio of less than 1.0 indicates that the costs outweigh the benefits.