

Chapter 2 An introduction to Microeconomics and the role of markets

2.1 An introduction to microeconomics and the role of markets

This chapter focuses on a well-established model that can be applied to a range of markets. It is used to make predictions about the effect of changing economic circumstances on prices and quantities sold in product, factor and other markets, such as the money market and the foreign exchange market. This area of study is referred to as microeconomic analysis, where **microeconomics** is the branch of economics that looks at the behaviour of the individual economic agents (usually households and businesses) that make up the whole economy. In this area of study, we are interested, primarily, in the motivations of consumers and producers (or suppliers) and how they respond to changing incentives in individual markets. We are especially interested in the role of relative prices in allocating the scarce resources that were discussed in Chapter 1. The model discussed in this chapter gives us the opportunity to investigate and to analyse the potential consequences associated with the changing demand and supply conditions that frequently occurs in markets.

Microeconomics underpins the use of 'macroeconomic analysis, the study of which follows later in the course. This chapter will analyse how the market mechanism, which relies heavily on changes in prices, is able to determine the types of goods and services that are produced, how those products are produced and ultimately the allocation of resources.

2.2 Perfect markets

A **market** is the main instrument for allocating scarce resources in Australia. It is therefore the primary way to answer the three key economic questions discussed in Chapter 1:

What to produce

How to produce

For whom to produce



A **market** is seen as any type of arrangement (which may or may not be a physical space) that facilitates exchange between buyers and sellers. The purchasers of goods and services may be households, businesses, governments or a range of other economic groups such as not-for-profit organisations. The suppliers of goods and services are generally businesses, but in the market, households supply businesses with their labour (this will be explored in more detail in Chapter 5). In Australia, government bodies also frequently supply goods and services. Buyers and sellers may meet in the same space, such as a shop, or they may communicate online, either domestically or internationally. Goods and services are sold in **product markets**, while the factors of production (inputs) are sold in **factor or resource markets**, such as the labour market. The model developed in this chapter can also be applied to the money market to determine interest rates, as well as the foreign exchange market to determine the exchange rate for a nation.

As we saw in Chapter 1 (Box 1.1), when economists develop theories about consumer and producer behaviour, they often make simplifying assumptions. When undertaking analysis of markets (demand and supply analysis), the model that will be used is based on the idea that the markets considered are highly competitive. This is a fundamental premise of the analysis that will be undertaken, and therefore it is important to keep it in mind when considering the information that follows. The word competition is used frequently in everyday language, especially by businesses, who would like you to believe that you are getting a good deal. When studying economics, however, **competition** is defined with reference to a set of criteria.

The market structure that forms the basis of demand and supply analysis (to illustrate how the market mechanism works) is called **perfect competition**. It can also be referred to as a 'perfect market' or a 'perfectly competitive market'. The three conditions required for a perfect market are as follows:

- There is assumed to be a large number of buyers and sellers such that each economic agent acts independently in the market. No individual buyer or seller therefore has the market power to influence the price. This leads to the condition of **price taking** in the perfectly competitive market.

- It is assumed that the products being sold in a perfectly competitive market are **homogenous**, which means that they are virtually identical and easily substitutable. This encourages the suppliers to offer the products at the lowest possible price, because this is the main way to attract customers (rather than, for example, being a better brand).
- There is **ease of exit and entry** into this market. There are low set up costs in the industry, which means that if profit making opportunities exist (for example, because the good or service has increased in popularity), then new entrants can seek to capture a share of the market, possibly by undercutting the existing suppliers who may be making very high profits in the short term. These very high profits are referred to in economics as **'abnormal profits'** or **'super-normal profits'**. [See the Study Tip below for an explanation of how economists view profits and costs.

In addition, the perfectly competitive market is based on the following assumptions (some of which were discussed in Chapter 1):

- Buyers and sellers operate with **full information**. They are aware of what they are buying and selling and are able to easily compare prices. Based on this information, they make fully informed **rational choices**.
- Resources are **mobile** and will be reallocated towards those areas of production that generate the greatest benefit.
- Both the buyer and the seller seek to maximise their own wellbeing. For the seller this means to **maximise profit** and for the purchaser it means to **maximise utility** or satisfaction.

In a perfectly competitive market there is generally minimal intervention by the government. If the government intervenes in the market, it would distort the price mechanism and lead to a different set of relative prices and therefore influence how resources are allocated. (Relative prices is an important concept that is defined later in section 2.9 of this chapter.) The role of government in the market will be considered in Chapter 3, but for most of this chapter, the role of the government in influencing the market will generally be ignored. In some of the case studies, the effect of government policy initiatives will be analysed and this will provide more insight into how the government can affect relative prices and the allocation of resources.

The behaviour of producers and consumers in a competitive market

In a **perfect market**, consumers and businesses are assumed to be acting in their own self-interest at all times. Consumers will want to obtain the good or service they wish to purchase for the lowest possible price. If they are willing to purchase the good or service at a certain price, then they are giving the suppliers a clear signal that they value the good or service at least that much. If they obtain the good or service for less than the maximum they are willing to pay, then they have obtained what is referred to as consumer surplus. **Consumer surplus** is therefore the difference between the price the consumer is willing to pay and the market price. The seller in a competitive market, on the other hand, will try to sell their product at the highest price possible to maximise their **profits** (revenue less expenses). If they are able to sell the product at a price above their minimum selling price (which is assumed to be equal to their economic costs) then they generate a **producer surplus** (the difference between the price the producer is willing to sell the product for and the market price). The price that is determined in any market is therefore a compromise between how much the consumers are willing to pay for the product and how much suppliers are willing to accept for their product.

When discussing the perfectly competitive market we are therefore analysing how consumers and businesses are behaving and interacting, and we would expect to find many different kinds of competition between economic agents in these markets. We expect firms to compete against each other to attract customers. The main way they do this is to offer the lowest price possible to the consumer. Competition therefore encourages them to seek the lowest cost method of production. We also expect consumers to

compete against each other to gain access to the scarce products that are available in the market. When there is more demand for a product than supply, the consumers may try to compete with each other by offering higher prices to purchase the product. Competition also takes place between individuals seeking to obtain the best job or between firms

Study tip

'Economics costs' have a specific meaning that makes them quite different to the accounting costs. Economic costs are intricately related to opportunity cost and represent both the explicit (accounting) cost and implicit costs associated with any investment or production decision. To illustrate, if a small business makes sales of \$180,000 and has expenses of \$80,000, then the accounting cost is \$80,000 and a profit of \$100,000 is made. However, if the owner could have generated \$100,000 in income by using her time working as an employee instead of owning and running the business, then the economic cost becomes \$180,000 and the profit is zero. In this example, economists would say that the business owner is neither making an economic profit or loss. Instead, it is a normal profit and, ceteris paribus, is just enough to keep her in the business. If the owner makes less than normal profits (an economic loss) in the long run, then she is likely to exit the industry. When firms make economic profits above zero, it is likely to entice other producers to enter the industry in search of 'above normal profits' (also called super-normal profits).

trying to secure the best workers. Nations, which produce a wide range of similar goods and services, are also seen to be competing against each other in international markets.

While not all markets that are studied will meet all of the criteria for a perfect market, the conclusions reached in this analysis are often transferable to other market structures. Prices may not change quickly in some markets and resources may be difficult to move from one industry to another, but for most markets, changes in behaviour and circumstances will result in some form of disruption to the market that leads the types of changes that are predicted by the models we will use. As you become more competent with your application of these models, you may wish to analyse how accurately they can predict what is happening in the real world. As you will come to see, in most markets, competitive or otherwise, the laws of demand and supply are still relevant.

The remainder of this chapter is essentially concerned with an analysis of the **market mechanism** (or **price mechanism**) which describes how the forces of **demand** and **supply** determine the **relative prices** of goods and services, which then ultimately determine the way our productive resources (e.g. natural, labour and capital) are allocated in the economy.

2.3 The law of demand and the demand curve

As mentioned in the previous section, buyers in any market will generally want to obtain the product at the lowest price possible, and will exchange the amount of money for what they see as equal to, or less than, the value they place on the product. It is logical therefore that at higher price levels, the demand for most goods and services will decrease. As the price rises, the opportunity costs associated with purchasing the product will increase, resulting in some buyers dropping out of the market. In simple terms, the willingness and ability to purchase the good or service diminishes as prices rise. (We should keep in mind, however, that there are always exceptions to most economic laws, so this will not be the case for every single good or service).

The law of demand

The **law of demand** indicates that there is an inverse relationship between the price (the independent variable) and the quantity demanded (the dependent variable). This law is based on the assumption that all other variables that could affect the demand for a product are held constant (the *ceteris paribus* condition discussed in Box 1.1 in Chapter 1). In other words, if we assume that nothing else in the market changes, just the price, then the quantity demanded will change in response to that change in price.



As the price decreases, the quantity demanded increases.

As the price increases, the quantity demanded decreases.

The law of demand makes sense for the following reasons:

- Some people may no longer be able to afford the product as the price rises. At a lower price, we can afford more of a good or service. As the price increases, however, some household budgets will be insufficient to purchase the product. Economists commonly refer to this as the **'income effect'**.
- Price is generally seen as an obstacle that may deter people from buying a product and an increase in price may mean that the supplier is now asking for an amount that exceeds what people think the product is worth. Given that each person is assumed to have an amount they are willing to pay for a good or service (based on its **perceived value** to them), it makes sense that at higher prices less will be demanded. More people will drop out of the market as the price exceeds its perceived value.
- Higher prices may also encourage consumers to look at the alternatives that are available in the market. When the price of one good increases, consumers will look towards cheaper substitutes, so quantity demanded is likely to fall. Economists commonly refer to this as the **'substitution effect'**.
- Many products are subject to **diminishing marginal utility**. Diminishing marginal utility (also discussed in Box 1.1) recognises that each additional unit that is consumed (referred to as the 'marginal' unit) will add to a

Study tip

It is important for students of Economics to remember that, when we are talking about the law of demand, we are talking about the response of the quantity demanded to a change in price, not how changing demand affects the prices of goods and services. Consideration of factors other than price causing changes in demand will occur in the next section.

person's level of satisfaction (i.e. add to their 'utility'). However, the benefit received from each additional unit falls with each successive unit consumed. It may still be a positive experience, but the level of utility (satisfaction) is less for the second unit than the first and so on. In other words, diminishing marginal utility refers to the idea that each successive item of the product purchased yields less satisfaction. This affects a consumer's willingness to pay for a product. If the first apple you consume yields a certain amount of satisfaction, it would be expected that a second apple consumed straight after that would yield less satisfaction. Each successive apple will yield even less satisfaction, so the amount you are willing to pay for those extra apples tends to decrease. As a result, you will only buy the extra units if the price is lowered. This links to the second reason why the law of demand makes sense, because each successive unit of the good consumed is seen to have a lower perceived value for most consumers.

Attending a **house auction** is one way to experience the law of demand first hand. There is one unique product available for sale (the house) and there are generally a number of possible buyers who are interested in the property. In this environment, the potential buyers generally compete against one another. Those who are interested in the property are likely to place bids for the property, with the bids usually starting below what a number of those interested in buying are willing to pay (in some cases, no one will bid and the house will be passed in). As the price is bid up, the number of potential buyers decreases. The person who places the highest bid may or may not win the auction. They will only get to purchase the house if their bid is above the vendor's (seller's) reserve, which is the lowest price the seller is prepared to sell for. Those who have dropped out of the race have either accepted that the price is above their budget (income effect) or have decided that the house is not worth the price that has been reached (beyond their perceived value). There may also be similar houses (substitutes) nearby which they believe may sell for less. If there is only one person who is interested in the property or the second highest bidder doesn't value it as much as the highest bidder, then the purchaser may obtain the house for less than what they were willing to pay (and hence gain some consumer surplus). Thankfully, the real estate agent is unable to read the mind of the potential buyers.



An alternative way to think about the law of demand is to think about the sales conducted by retail outlets. When stock is released to the market, it may sit on the shelf for longer than what the retailer would like. The retailer is then keen to free up shelf space (and earn some income so that they can pay their creditors), so they reduce the price to attract customers. As the price is reduced, some consumers will decide that the product is now worth the lower purchase price and sales should increase. More consumers will also be able to afford the product. When shops have sales in the modern era, it also has a psychological effect and it is not unusual for consumers to queue for hours to 'grab a bargain'. Retailers create the feeling that the sales won't last and people may fear missing out on the bargain.

Constructing a demand curve

There are a range of factors that affect the quantity demanded in any market, but people cannot generally visualise more than two dimensions. Economists have therefore decided that it makes more sense to choose the most important factor that influences the demand for most goods and services, namely price. The demand curve shows the relationship between various possible prices for a product and the quantity that consumers in the market would be willing and able to buy at each of these prices. This total demand in the market is based upon the total amount demanded by each individual consumer i.e. the sum of all individual demand curves). It is important to be aware that demand is not considered to be hypothetical. Consumers must not only want to buy the good or service but they must be able to purchase it (i.e. be able to afford it). You may want to purchase a new sports car, but unless you have the income to pay for it (and are willing to sacrifice this income) then it will not enter into our demand and supply analysis. This willingness and ability to pay is sometimes referred to as **effective demand**.

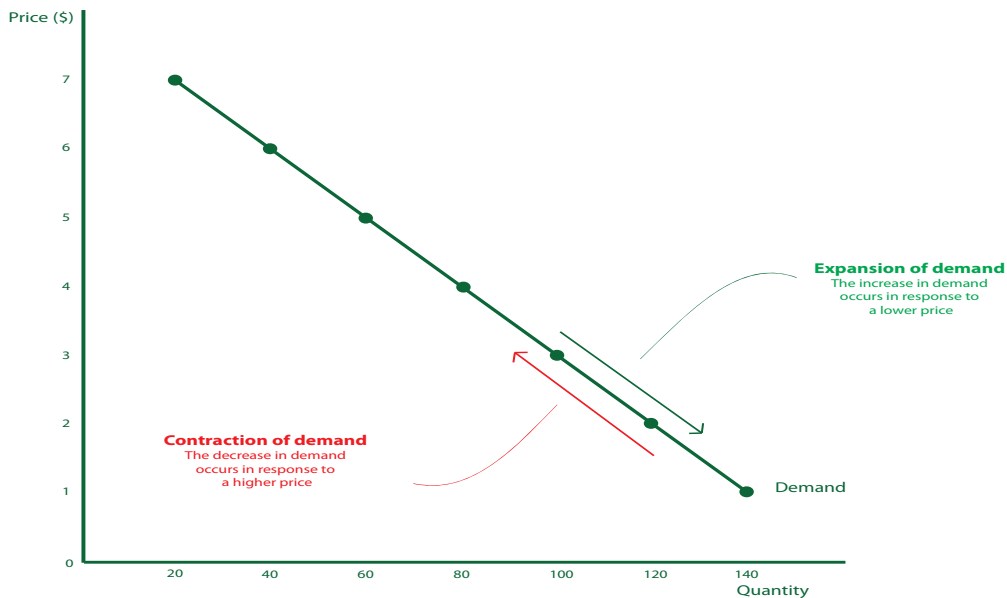
Consider the following hypothetical information about the market for green smoothies, represented in a '**demand schedule**'. Green smoothies have become increasingly popular in the twenty first century as consumers look to replace their sugary beverages with juices and smashed up (blended drinks of) fruits and vegetables (called smoothies). Table 2.1 shows the daily number of green smoothies that would be purchased at any given price on any given day in a hypothetical market. It is clear that the demand for green smoothies follows the law of demand. Lower prices result in an increase in the quantity demanded and higher prices result in a lower quantity demanded. For example, if the price of green smoothies increases from \$5.00 to \$7.00, demand for green smoothies **contracts** from 60 per day to 20 per day.

Price (\$AUD) per 500 ml	Quantity demanded per day
1.00	140
2.00	120
3.00	100
4.00	80
5.00	60
6.00	40
7.00	20



The law of demand is represented in a two-dimensional diagram with the price on the vertical (y) axis and the quantity demanded on the horizontal (x) axis. This is represented in Figure 2.1.

Figure 2.1:
Demand for green smoothies



It is important to note that when the price of the product changes, there will be a **movement along the demand curve**. When prices increase, demand generally **contracts** (moves left along the demand curve). When prices fall, demand usually **expands** (moves right along the demand curve).

The difference between a movement along and a shift of the demand curve

It is also necessary to be able to distinguish between a movement along the demand curve and a shift of the demand curve. In both cases the demand for a good or service will change, but the reasons for the change are different. A movement along the curve occurs when we are analysing a change in the price of the good or service. A movement along the demand curve to the left (a contraction) is caused by an increase in the price of the good or service. A movement along the demand curve to the right (an expansion) is caused by a decrease in the price. A shift of the entire demand curve will occur when one of the other factors of demand (i.e. not price) have changed, resulting in either an increase or decrease in the quantity demanded at any given price. This essentially means that the previous demand curve is no longer relevant for the new set of circumstances. These demand factors will be discussed in section 2.4.

Review questions 2.1

1. Define a market.
2. Provide three examples of markets where you have been involved in the exchange of a good or service in the last month.
3. Outline the three conditions for a perfectly competitive market? Explain how each condition increases the degree of competition in the market.
4. Explain how consumers might compete against each other in a competitive market. Give an example from your own experience.
5. Explain how suppliers might compete against each other in a competitive market. Identify and explain one market where you have witnessed firms competing against one another.
6. State the law of demand. With reference to the income and substitution effects, explain why the law of demand is a good explanation of how humans might behave in a perfectly competitive market when the price of a good or service increases.
7. Distinguish a movement along the demand curve from a shift of the demand curve.
8. Describe how an auction process highlights the law of demand. In your answer, distinguish the income effect from the substitution effect.
9. Explain what is meant by 'diminishing marginal utility', using the consumption of chocolate as your example.
10. Explain the link between diminishing marginal utility and the law of demand.



2.4 Microeconomic demand side factors that influence price and quantity

Until now, we have focused on the role of price influencing demand, since price is a significant factor that influences the demand for any good or service purchased in the market. There are, however, a range of other factors that will affect the quantity demanded for a given product. When the demand curve is constructed, it is assumed that each of these other demand factors is held constant (*ceteris paribus*). However, changes in these factors do occur, and such changes will cause the demand curve to **shift – a whole new demand curve** will be created whenever one or more of these factors changes.

If the demand curve shifts to the right this means that for each given price there is a greater quantity demanded, which is commonly expressed as an increase in demand. A shift of the demand curve to the left means that for each given price there is a lower quantity demanded, which is commonly expressed as a decrease in demand. Some of the more significant factors that affect the demand for goods and services include: disposable income, changes in interest rates, the price of substitutes, the price of complements, preferences and tastes, population and demographic changes and changes in the general level of consumer confidence across the economy. Each of these is discussed below.

Disposable income

Disposable income is defined as the rewards received by households from their direct contribution (from working) and indirect contribution (from the provision of land or capital) to the production process, plus government transfers less direct (income) taxes. This represents the **total amount that consumers have to spend on goods and services**. Disposable income could increase, for example, when a person gets a pay increase, the government cuts individual income tax rates or when a household receives dividends or makes capital gains from buying or selling assets.

$$\begin{array}{c}
 \text{Disposable income} \\
 = \\
 \text{Factor income} \\
 \text{[e.g. wages for contributing labour]} \\
 + \\
 \text{government transfers} \\
 - \\
 \text{direct (income) taxes} \\
 \text{on factor income}
 \end{array}$$



An increase in disposable income is generally associated with an increase in the demand for **normal goods**. This will shift the demand curve to the right, as consumers may be willing and able to purchase a greater quantity at any given price. A normal good is therefore defined as one where consumption of the good increases when income increases.

Economic theory predicts the opposite behaviour for consumers with regard to **inferior goods**. These are goods where demand actually decreases when disposable income increases. Goods that are often considered inferior include second-hand clothes, generic ('homebrand' or no-name) products sold in supermarkets and travel by bus. As income increases, consumers may choose to substitute towards new clothes, branded products and substitute away from public transport by purchasing their own vehicle instead.

Referring to the previous example regarding green smoothies, if the government granted an income tax cut to all workers, then the disposable income of all those who receive a taxable income would increase. Some of these workers may choose to spend their increased income on purchasing healthy beverages, (assuming at this stage that the price remained the same). Not all people with the extra disposable income will purchase more green smoothies but it is reasonable to expect that some of them will. Therefore, the overall demand for green smoothies would increase and more would be demanded at each price level.

This would be represented by a shift of the demand curve to the right and the demand information could change as shown in Table 2.2 below.

Study tip

It is important to distinguish between disposable income and discretionary income. Income tax increases will decrease disposable income but if the individual does not have savings, interest rate increases won't affect disposable income. This is because the individual will still receive the same rewards from their contribution to the production process. However, changes in interest rates is likely to affect discretionary income, especially for households who have loans with variable interest rates. Discretionary income is a measure of how much households have left over to spend on non-essential items after their core expenses have been paid.

Price (\$AUD) per 500 ml	Quantity demanded per day (D1)	NEW Quantity demanded per day after income tax cut (D2)
1.00	140	150
2.00	120	130
3.00	100	110
4.00	80	90
5.00	60	70
6.00	40	50
7.00	20	30

Figure 2.2: Demand for green smoothies [Shift of demand curve]

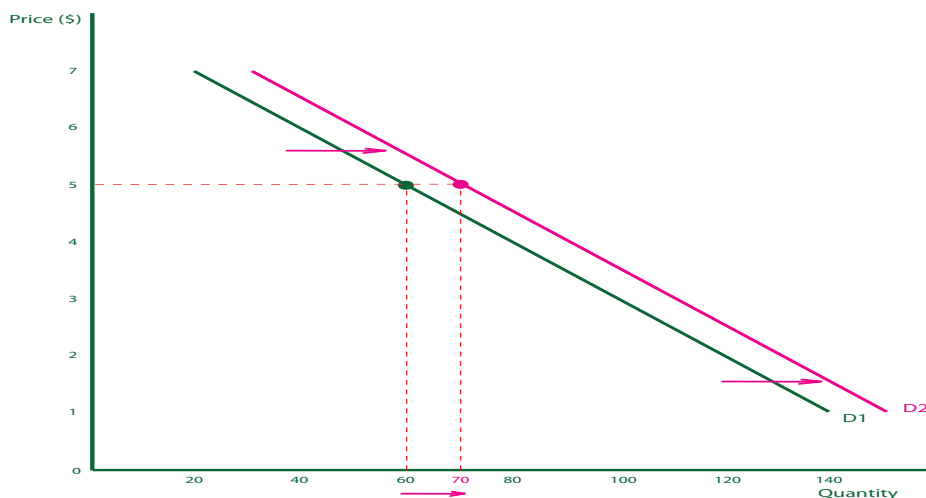


Figure 2.2 shows how a personal income tax cut affects the demand for green smoothies. For example, at a price of \$5.00 the demand has increased by 10 drinks per day, from 60 to 70. This increase in quantity demanded occurs at every other price, which is why the demand curve has shifted to the right in a parallel fashion. The tax cut in this case is likely

to result in an extra 10 green smoothies being demanded per day as some of the extra disposable income has been allocated to the consumption of green smoothies. People who like them might be buying more or those who could not afford them before the tax cut may now feel that it is within their budget. It is important to note that we can't yet predict how many smoothies will actually be sold, as this will depend also on the supply conditions in the market at the time, which will be considered in the next section.

Interest rates and other factors affecting discretionary income

Interest rates represent the reward for lending (saving) or the cost of borrowing, expressed as a percentage of the **principal** (the amount lent or borrowed). Increases in interest rates are likely to have the greatest impact on the behaviour of those who are indebted. Most home loans in Australia are usually offered with variable interest rates, which means that the banks can adjust the interest rate payable in line with changing economic circumstances (usually, but not always when the RBA changes the cash rate). An increase in interest rates will mean that indebted households (and businesses) will have less **discretionary income** after paying interest. This is likely to result in a decrease in demand and a shift to the left of the demand curve for many goods and services. In this case, less will be purchased at each price. Those goods that are deemed by consumers to be less necessary may be affected more than essentials such as food.

There are a number of other ways (called transmission mechanisms) that changes in interest rates can affect the demand for goods and services. These will be discussed in more detail as part of the analysis of monetary policy (Chapters 10 and 11).

When using the term discretionary income, economists are referring to the amount of disposable income that is left over (or available) after households have paid their essential bills. The word 'discretionary' indicates that there is some degree of choice involved in what households are spending money on. Therefore, spending on such non-essential items is often classified as '**discretionary spending**'. For example, between 2017 and 2018 the price of petrol increased by approximately 30 to 40 cents per litre. CommSec estimated that this increased the average monthly spending on fuel by approximately \$30 to \$40. At the time, many economists were suggesting that this was equivalent to the effect of a 0.25% increase in interest rates, because the discretionary income for the average family decreased. While their disposable income (income received after income tax) had not changed, for many households, petrol is a necessity, and therefore a significant increase in the petrol price meant they had less money remaining to spend on non-essential items.



Other key bills paid by households that would therefore influence discretionary income, in addition to mortgage repayments, may include utility bills such as gas, electricity and water, rates and rent (for those who do not live in their own home).

The price of substitutes

A **substitute** is a viable good or service that may be used instead of the product in question. From the consumer's perspective, this means that substitutes provide the user with a similar experience or fulfil a similar need. Remember that one of the reasons for the demand curve being downward sloping is that when the price increases, it is assumed that some customers will switch to cheaper alternatives. If a substitute becomes cheaper, and the price of the good we are analysing doesn't change, then it is assumed that demand for the original good will fall, resulting in a shift of the demand curve to the left as consumers substitute into the relatively cheaper good. In the market for green smoothies, Boost Juice and Juicemaster may be seen as competitors. Juicemaster would like to attract customers from Boost, so they start to offer their smoothies for one dollar cheaper than Boost. This new information must be incorporated into our demand analysis. Some consumers, noticing the lower prices at Juicemaster, will purchase their smoothies from Juicemaster, resulting in a decrease in demand for green smoothies from Boost. This is likely to result in a shift to the left of the demand curve for Boost green smoothies.

You will find substitutes in most product categories and whenever there is a change in the price of one of these products it will have implications for another. Some may see Fuji and Pink Lady apples as substitutes. For those who prefer sugary drinks, Coke and Pepsi are substitutes and when seeking out new trainers one might see Adidas and Nike as viable alternatives.

The price of complements

Complementary products are generally consumed together. They are products that are sold separately but are used together, each creating a demand for the other. Therefore an increase in the price of a complementary good will be viewed by the consumer as an increase in the price of the combined experience for both goods. The recent resurgence of vinyl (records) in the 2010s has surprised many analysts, especially those in Australia who closed down all manufacturing operations in this area. As the price of record players has continued to decrease (due to being able to produce larger volumes), this has helped to generate extra demand for records. Similarly, if the price of records was to decrease then more people may be tempted to purchase this form of media and they would need a record player to use the records. So if vinyl records get cheaper (which may happen if the producers are able to manufacture on a larger scale), then demand for the record players might increase.

Complementary products also highlight how markets can be interdependent. An increase in the price of milk, for example, could lead to a decrease in the demand for gluten free muesli. An increase in the price of petrol could result in a decrease in the demand for cars that are less fuel efficient because the degree of complementarity is high.

Preferences and tastes

Demand may be affected by an individual's **tastes, attitudes and preferences** towards each good or service. In recent times, greater media attention has been paid to the effect of diet on one's health. This has influenced many people to increase their consumption of green smoothies (as discussed earlier). Knowledge of the product's detoxification properties, for example, could influence tastes and preferences. As a result, the demand curve for green smoothies has shifted to the right over time and more smoothies have been demanded at each price point.



As mentioned in the section on complementary goods, the recent (and somewhat surprising) resurgence of vinyl as a musical source has been driven by people who prefer analogue recordings to the perceived coldness of digital audio. Commentators have also suggested that the movement back towards analogue products is a rejection of technological advancement, while others have called it a 'hipster fad'. Either way, consumers' tastes have been affected, and the demand curve for records has increased by a large percentage. This has occurred despite the fact that vinyl records are often twice as expensive as the CD or significantly more expensive than streaming services such as Spotify.

Similarly, when performance artists tour Australia, their music sales (both digitally and in physical form) tend to increase. Consumers are exposed to the music of the performer and the performer may become more fashionable. Going to see a music concert can influence the way the consumer considers and appreciates the music. The death of an artist also tends to have a positive effect on demand for their art. Advertising is obviously designed to heavily influence tastes and preferences. Successful advertising campaigns can result in a significant shift in the demand curve to the right and could negatively impact the demand for substitute goods.

Population growth and demographic change

A **growing population** will generally need more goods and services, so it is not surprising that the production of goods and services will usually increase every year given that Australia's population continues to grow. This is one reason why businesses often encourage governments to increase or at least maintain their high immigration targets. It has also been argued that Australia's relatively high immigration targets have contributed to the on-going increase in house prices as the demand for houses at each price point has increased.

The structure of the population may also affect the range of goods and services that are sold in the market. Australia has an **ageing population** because there were more births per woman in the years between 1945 and 1965. The large increase in population at that time is referred to as the baby boomer generation. This means that a larger percentage of the population are currently over 65 (and this will continue to increase). In fact, this percentage is currently higher than ever before in history. People from this generation are living longer and this may mean that demand for certain products increases, such as healthcare and aged care. Demand for retirement village living has also increased, with many projects selling out in a short period of time. The disproportionate number of people in this generation may skew production towards the types of goods and services that this group prefers.

Activity 2b: Kombucha – good bacteria

Since we wrote the last edition the publication of the last edition of this textbook, there has been exponential growth in the demand for a previously largely seemingly unknown product called Kombucha. When presented with the facts about how Kombucha kombucha is made, many consumers may show little interest in the product. It is, after all, a fermented black tea where the live scoby culture feeds on the sugar. Most of the sugar is removed and the drink is naturally carbonated. As economists, we seek to analyse and understand why the demand for such a drink can grow so rapidly. To do this, we look at the market in terms of the factors that result in an increase in demand (both a shift to the right of the demand curve and an expansion movement along the demand curve).



Changes in tastes and preferences

In the last 2 to 3 years, there has been a significant increase in the amount of information available which highlights how the consumption of sugar contributes to a range of preventable diseases. This may encourage some consumers to substitute away from sugary carbonated drinks. These consumers may have sought out a low sugar alternative that provides them with a similar level of refreshment.

The live bacteria in the kombucha is also seen by some health professionals as a welcome addition to the diet as it helps to correct and maintain a well-functioning digestive system. Reports in the media and word-of-mouth recommendations have influenced many consumers to try kombucha, which they may never have heard about before. The growing interest and popularity of kombucha is evident everywhere as the product can now be easily purchased at cafes, at the airport and in the supermarkets. Coca Cola, acknowledging the growth potential in the market, purchased Organic & Raw Trading Company, who make MOJO Kombucha, to help Coke combat falling sales of sugary soft drinks. The kombucha producers have also been involved in marketing campaigns, providing samples to potential consumers at farmers' markets. In addition, celebrities have actively endorsed the product.

Each of these factors have resulted in a change to tastes and preferences and this has contributed to a shift of the demand curve to the right.

Prices are falling

Another reason that kombucha has grown in demand is that the industry has become more competitive. The manufacturer of Remedy Kombucha recently started selling their product in a plastic bottle which has allowed them to sell at a lower price - although its original product is still sold in a more expensive glass bottle. [The effect of competition on supply and price is covered later in this chapter.] Remember that a lower price tends to result in an expansion along the demand curve. Kombucha is still relatively expensive compared to traditional soft drinks with a one litre bottle retailing for approximately \$8 compared to \$2 for Coke, but demand is likely to have responded to falling prices as a greater number of people can now afford the drink and its relative price (while still high) has fallen over time. Some people may also see it as a substitute for alcoholic beverages such as apple cider. It can be purchased at a similar price and the health effects are very different!

Questions

1. Define the law of demand.
2. Give one reason, with reference to the case study, why falling prices may be associated with an expansion of demand.
3. Distinguish between a movement along the demand curve and a shift of the demand curve.
4. Explain why, in the market for kombucha, there has been a shift of the demand curve and movement along the demand curve.
5. Identify and explain two factors that have resulted in a change in the tastes and preferences for kombucha. You may choose factors that were not mentioned in the case study. Illustrate and explain how each change has affected the demand curve for kombucha.
6. Identify and explain one factor that may have contributed to the change in tastes and preferences for traditional soft drinks like Coke. Illustrate and explain how this change may have affected the demand curve for these types of products.
7. Identify and explain two other factors, that are not mentioned in the case study, that could result in a shift of the demand curve for kombucha (you may discuss an increase or a decrease in the demand for kombucha).

2.5 The law of supply and the supply curve

While a higher price may act as a deterrent to the consumer, it tends to act as an incentive for the supplier of a particular good or service. To the supplier, each unit sold represents an increase in their revenue. A higher price received for each product will also result in an increase in revenue received. Assume, for example, a farmer can use her land to grow a range of crops, but she has decided to focus on the production of strawberries. An increase in the price of strawberries in the market (which could be driven by a change in tastes and fashion in the market) would tend to encourage this farmer, and possibly other farmers, to increase the supply of strawberries in the market. They might be able to achieve this by using up more of their available land or by increasing productivity. They recognise more profits are likely to be made from strawberries than any alternative use of the land. As a result, the opportunity cost of producing a product that is not strawberries has increased.

In addition, for some suppliers, a higher output level might be associated with higher per unit costs of production. When the scale of production increases beyond a certain point, the firm's capital resources may become crowded at relatively high production levels. The production facility becomes stretched, bottlenecks start to appear and efficiency declines. As a consequence, the costs associated with each additional unit of production start to rise so the prices needed to cover the costs also increase. Therefore, to encourage extra supply, the supplier needs to receive a higher price.

Law of Supply

The law of supply indicates that there is an positive relationship between the price (the independent variable) and the quantity supplied (the dependent variable).

As the price increases, the quantity supplied increases
As the price decreases, the quantity supplied decreases

The law of supply makes sense because:

- a higher price received for the product represents an increase in revenue for the supplier;
- a higher price increases the opportunity cost of using resources to supply an alternative product; and
- to increase production, the cost per unit might increase (i.e. in this model, the marginal cost is assumed to rise).

As part of our basic microeconomic model, we have intrinsically assumed that the business operates to maximise its profits. Therefore it makes sense that, if all else is held constant, a firm will prefer to sell its product at a higher price. The firm will therefore supply more if it thinks it can get a higher price for it.

It is useful to think about supply in terms of what prices will be required to encourage producers to supply the market with a given quantity. At the very minimum they need to cover their economic costs. There are a range of factors that affect the quantity supplied in any market, but it is assumed that these are held constant (*ceteris paribus*) for each of the different price levels when the supply curve is constructed.

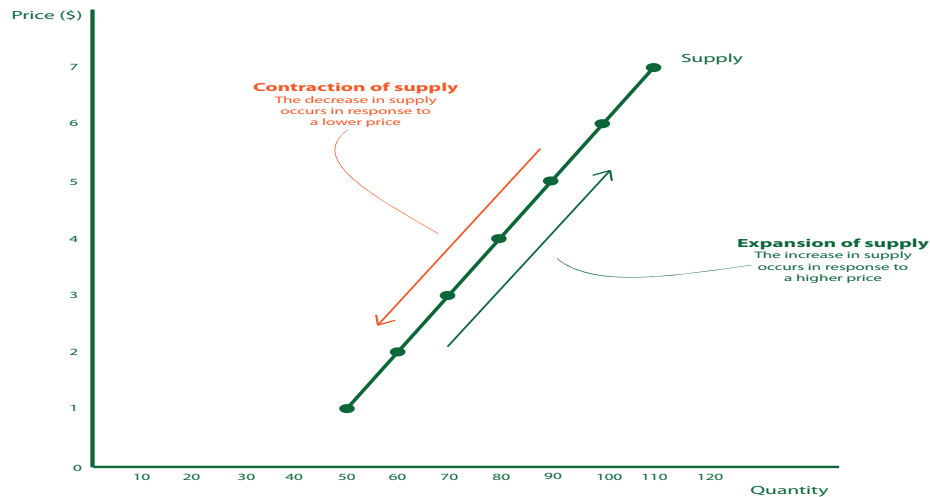
Constructing a supply curve

Table 2.3 shows the number of green smoothies that would be supplied at any given price in our hypothetical market. It is clear that the supply for green smoothies follows the law of supply. Lower prices decrease the quantity supplied and when price increases from \$1 to \$2, supply expands from 50 per day to 60 per day. Like the demand curve, the supply curve can be represented in a two-dimensional diagram with price on the vertical axis and quantity supplied on the horizontal axis. This is represented on the supply curve in Figure 2.3.

Price (\$AUD) per 500 ml	Quantity supplied per day
1.00	50
2.00	60
3.00	70
4.00	80
5.00	90
6.00	100
7.00	110



Figure 2.3:
Supply of green smoothies



The difference between a movement along and a shift of the supply curve

As discussed in section 2.3 with regard to the demand curve, it is also necessary to be able to distinguish between a movement along the supply curve and a shift of the supply curve. In both cases the supply of a good or service will change, but the reasons for the change are different. A movement along the supply curve occurs when the product's price changes and this causes the quantity supplied to change. A movement along the supply curve to the left (a contraction) is caused by a decrease in the price of the good or service itself. A movement along the supply curve to the right (an expansion) is caused by an increase in the price. This can be seen when the price increases from \$4.00 to \$5.00 - the supply will expand from 80 to 90.

A shift of the entire supply curve will occur when one of the other factors of supply have changed (i.e. not price), and, therefore, at any given price there is either an increase or decrease in the quantity supplied. If the supply curve shifts to the right, this is described as an increase in supply. If the supply curve shifts to the left, this is described as a decrease in supply.

2.6 Microeconomic supply side factors that influence prices and quantity

There are a range of factors that will cause the supply curve to shift. When the supply curve is constructed, it is assumed that each of these supply factors (other than price) is held constant (the *ceteris paribus* conditions). Whenever one or more of them change, the position of the supply curve will change and a **whole new supply curve is created**.

A change in a factor of supply (also called a supply factor) will cause a shift in the supply curve. If a supply factor causes supply to increase, the supply curve will shift to the right. If a supply factor causes supply to decrease, the supply curve will shift to the left. Some of the more significant factors that affect the supply of goods and services are examined below.

Study tip

When trying to conceptualise the impact of a shift to the left of the supply curve, it can be useful to assume that quantities remain unchanged and then ask the following question: *What price does the supplier now need to charge to justify supplying that particular quantity?* The price needs to be higher at every quantity level or else the supplier will no longer be willing to supply. Consequently, this causes the whole supply line to shift left.

Changes in the costs of production

Each good and service that is produced in the economy requires resources, which are often referred to as the **factors of production** (i.e. land, labour and capital). The position of a firm's supply curve will depend on the costs involved in making a good or service as this will influence the price the producer is willing to accept in return for the good.

Referring back to the market for green smoothies, there are a number of resources that are needed to put together this nutritious drink. The drink may be made from spinach, kale and something like an apple to provide the sweetness needed

to entice many customers to consider the drink. A shortage of kale for example could result in its price increasing, leading to a higher cost of production for the smoothie supplier. Similarly, if the price of oil increased then each smoothie would cost more to make as it would cost more to transport the ingredients to the store (since oil is the key ingredient in the petrol used to power most transport). Similarly, if the owner of the building charged higher rent to the smoothie business, then the smoothie producer's costs of production would increase. As a result, the supply will decrease at each given price, which is represented by a shift to the left of the supply curve. In other words, the higher costs of production reduce the willingness and/or ability of the retailer to supply at a given price. Refer to Box 2.1 for further information about the common costs that can affect the supply curve of most businesses.

Study tip

One of the biggest challenges faced by students studying supply is that they start to discuss the reaction in terms of demand. This intrinsically makes sense because most of us are consumers, but few of us own businesses. Therefore, it is recommended when analysing supply that you seek to view the question from the perspective of an individual business owner. Ask yourself how the change in a relevant factor will influence their willingness and ability to supply (at each given price point). Try, at least to begin with, to analyse this independently of any change in demand.

Box 2.1 Common costs of production

The common costs of production faced by businesses include the following:

- Wages/Salaries and other on-costs such as superannuation and WorkCover premiums
- Rent and property expenses
- Interest on loans and overdraft facilities
- Utility bills such as electricity, water, telephone/internet and gas
- Delivery costs
- The cost of technology
- The rate of depreciation of assets
- The cost of raw materials used in the production process
- Financial and insurance services
- The level of government assistance or taxes and charges
- The value of the \$AUD affects the cost of using imported components in the production process



Technological change and productivity growth

New technology will generally increase the productivity of existing resources. **Productivity** measures the output per unit of input. One measure of productivity is **labour productivity**, which is measured by the total output (the volume of production) for each hour that is worked. The introduction of new and more advanced capital in the production process may result in a greater volume of goods and services produced for each hour worked. If the price of the resources used (such as labour) remains constant, this should result in a decrease in the cost per unit of output. Higher levels of productivity would therefore enable the supplier to supply more at each price level.

With reference to the smoothies market, the introduction of robots in the production process could result in a reduction in the costs of production for the supplier. If robots were able to take orders from the consumers and then make the drinks, then over time, the supplier will experience lower production costs, especially at the margin (even though the initial cost to introduce the robots may be very high). The robots would be unlikely to get tired and make mistakes, need a rest or to go to sleep, so a greater volume of drinks may be able to be produced per hour (their cost per hour would therefore be much lower).

New technology could also, over time, reduce the cost of operating a smoothies business. Electricity costs could decrease as solar technology improves and new technology could be introduced in the agricultural sector that increases the productivity of land. This could increase the supply of kale such that the supply of smoothies could increase. Therefore, technological improvement is likely to result in an increase in productivity and lower the costs of production, therefore resulting in an increased supply at all price points (shifting the supply curve to the right).

Study tip

Remember that when demand or supply increases, the respective curves shift right, and when they decrease, the curves shift left. Avoid talking about moving the curves up or down.

Review questions 2.3

1. Define what is meant by the law of supply.
2. Explain, using sound economic reasoning, why the law of supply is a good explanation of how a business is likely to behave when the price of the goods or services they want to supply increase.
3. Distinguish between a movement along the supply curve and a shift of the supply curve. In your answer, make reference to the terms used to describe movements along and shifts of the supply curve.
4. Identify and explain two factors that may lead to an increase in the cost of production for wedding photography.
5. Explain how an increase in the cost of production might affect the position of the supply curve.
6. Explain how an increase in the price of bananas might affect the supply of pineapples (assuming they can be grown on the same land).
7. Explain how climate change may be associated with changes in the supply of certain products. Refer to at least three specific products as part of your answer. (This question may require some addition research)
8. Identify two recent technological changes that are not mentioned in the text and explain how they may be associated with an increase in supply for the relevant industries.

Activity 2d: Climate change and disruptions to supply

The Queensland floods and cyclones of 2011 illustrated how extreme weather events can affect the ability and willingness of individual firms to supply. At the time, major transport routes (key infrastructure) were cut off and supermarkets experienced shortages of some key food products.

According to the government website climatechangeinaustralia.gov.au, extreme weather events, like those mentioned in this case study, will become more prevalent. Droughts are expected to last for longer and be more severe because they will be accompanied by hotter temperatures. Floods, bushfires and other erratic weather patterns are also expected to be more devastating to the nation's ability to supply.

While no one knows exactly how food production will be affected by climate change, there is some consensus amongst climate change scientists that a major regional food bowl, the Murray Darling Basin, will be negatively affected. The lack of a key resource such as water will make it significantly more difficult to grow a large number of fruits and vegetables as well as impose supply constraints on the production of wheat and dairy products.

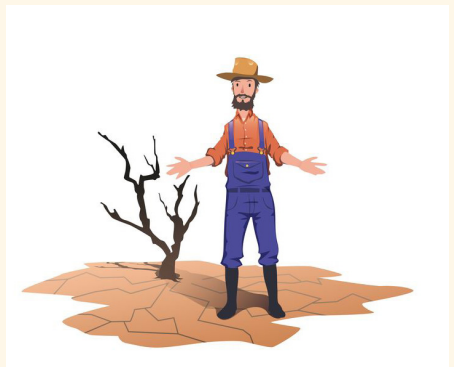
Cities, such as Melbourne, rely upon the food grown in regional centres as well as on the urban fringe (in areas called food bowls). Food, such as bananas, often travels vast distances (which contributes to climate change due to the burning of fossil fuels). These arrangements could be seen as inter-temporally inefficient because current consumption patterns might negatively affect the future capacity to grow food (and therefore reduce the living standards of future generations).

Climate change may also have a disruptive effect on other key industries that affect the ability of firms to supply. If extreme weather events are associated with temporary or long-term destruction of key infrastructure, then businesses may find it more expensive and difficult to meet the demands of their customers. For example, the South Australian Blackout of 2016 resulted in a widespread power outage for much of the state. Damaging lightning strikes and gale force winds were associated with a once in 50-year extreme weather event that damaged electricity infrastructure and meant that electricity supply was severely impeded. Businesses were forced to close down, and a large amount of perishable food had to be destroyed (ultimately adding to the cost of production for a range of food-oriented businesses). The supply across a wide number of businesses was therefore negatively affected (which is often referred to as a supply disruption).

Responses to climate change may also add to the costs of production for firms. If insurers expect that climate change events might be more frequent then the premiums that they charge their customers will need to increase, since premiums are based on the probability of making a claim. Governments may also implement policies that seek to reduce carbon emissions (such as a carbon tax) which will also add to the costs of production. As temperatures rise, firms may also have to spend more on air-conditioning.

Questions

1. Explain why there is a positive correlation between supply and price changes.
2. Explain how a 'disruption to supply' is likely to affect the supply curve for bananas.
3. Create a list of all of the possible negative impacts that a 'blackout', as described in the case study, could have on the capacity of individual businesses to supply.
4. Explain how government and business responses to climate change could result in increasing costs of production.
5. Discuss the view that climate change may have a positive impact on supply. (This question may require additional research and creative thinking).



To illustrate how these factors may cause the supply curve to shift, we will continue with the example of green smoothies. Let's assume that the costs of production fall by an average of \$1 per smoothie, perhaps because of lower raw material costs (e.g. cheaper fruit ingredients) or improvements in technology (cheaper and more efficient blenders). Table 2.4 below indicates that the suppliers will be willing to increase their supply of smoothies to the market at every price level. Alternatively, it means that for any given quantity of smoothies it produces, the producer is willing to supply them at a lower price (i.e. \$1 less per smoothie). On this basis, the supply schedule will change as shown in Table 2.4 below:

Table 2.4 Supply schedule for green smoothies		
Price (\$AUD) per 500 ml	Quantity supplied per day (S1)	NEW Quantity supplied per day after lower costs (S2)
1.00	50	60
2.00	60	70
3.00	70	80
4.00	80	90
5.00	90	100
6.00	100	110
7.00	110	120

Figure 2.4: Supply of green smoothies [shift of supply curve]

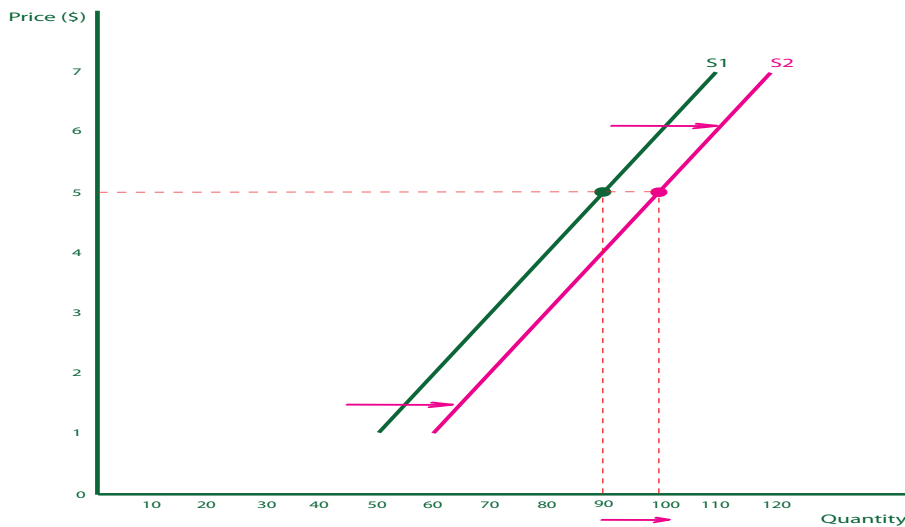


Figure 2.4 shows how the lower costs of production affects the supply curve for green smoothies. For example, at a price of \$5.00 the supply has increased by 10 drinks per day, from 90 to 100. This increase in quantity supplied occurs at every other price, which is why the supply curve has shifted to the right in a parallel fashion.



2.7 Market equilibrium

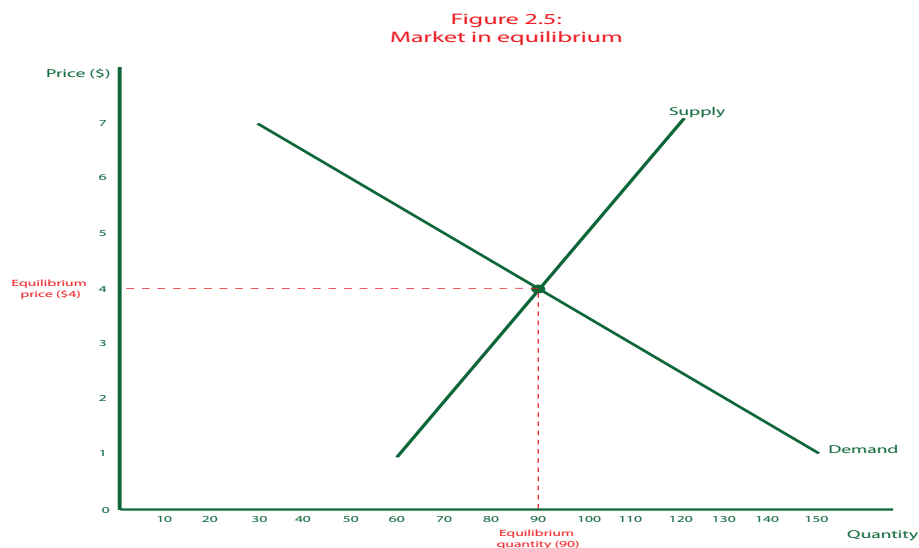
The demand and supply curve have so far been considered in isolation. They have illustrated, respectively, the quantities that the consumers and firms are willing to buy and sell at each price. In order to determine the price and quantity sold in any market, the interaction of supply and demand is needed. In reality, each market will arrive at a single price at a point in time. Remember that the consumer will want to obtain the good or service at the lowest price possible while the supplier will want to sell for the highest price to maximise their profits. The compromise that is reached in the market is referred to as the **equilibrium price** – the price where the quantity demanded is equal to the quantity supplied. The market therefore clears at the equilibrium price because every product that is made available for sale (at the going price) is sold and there is no excess demand or supply. The efficiency of this outcome will be discussed in section 2.9.

In Table 2.5, the demand for and supply of green smoothies is reproduced in one table. The table shows the demand and supply schedules after the respective increases in demand (as a result of income tax cuts) and supply (as a result of lower costs of production) as outlined in Tables 2.2 and 2.4 above. The table also shows the points of disequilibrium, where the price is either above or below the market clearing level, resulting in either a surplus or a shortage of green smoothies in the market.

Price (\$AUD) per 500 ml	Quantity demanded per day	Quantity supplied per day	Surplus (+) or shortage (-)	Quantity traded
1.00	150	60	-90	60
2.00	130	70	-60	70
3.00	110	80	-30	80
4.00	90	90	0	90
5.00	70	100	+30	70
6.00	50	110	+60	50
7.00	30	120	+90	30

You will note that there is only one price and quantity at which the quantity supplied is the same as the quantity demanded. That price is \$4.00 per smoothie – which is referred to as the equilibrium price. The quantity supplied and demanded at that price is 90 smoothies per day - which is the equilibrium quantity. Therefore, at that point, the market is 'in equilibrium'. At all other prices, there is either a **shortage** – where quantity demanded exceeds quantity supplied – or a **surplus** – where quantity supplied exceeds quantity demanded.

The market in equilibrium is depicted in Figure 2.5 below:



When the market is in equilibrium, it is also referred to as being in a **state of rest**. In the case of smoothies, a price of \$4 will ensure that there will be neither a surplus nor a shortage at the end of every trading day. There is no pressure for the price to change from \$4 unless there is a change (or shift) in demand and/or supply such that one or both of the curves

move to a new position. If this were to occur, the market would be in a temporary state of disequilibrium, with the price either being too high or too low, and surpluses or shortages would develop. Consumers and suppliers would alter their behaviour in response to the disequilibrium, which would return the market back to equilibrium.

Movement from disequilibrium to equilibrium

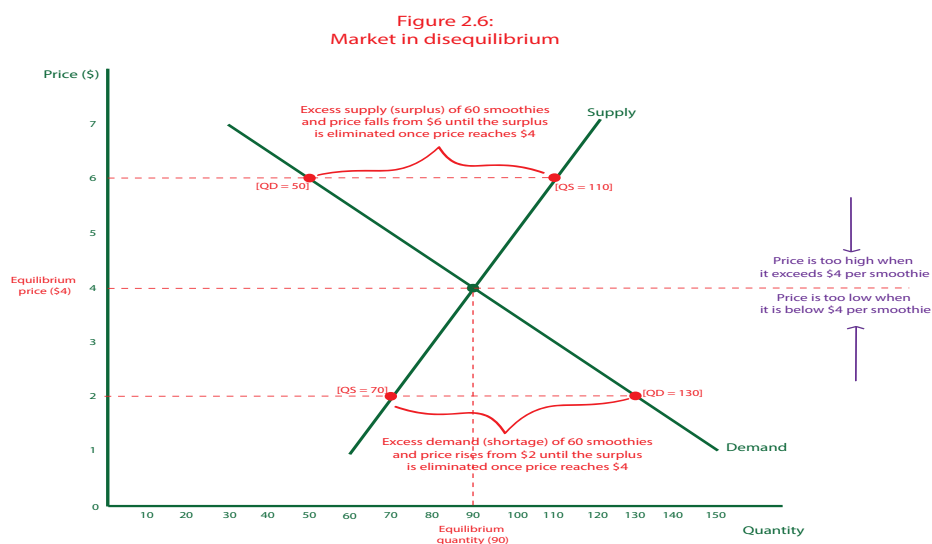
The market will always have a natural tendency to move towards equilibrium. When price is above equilibrium, normal market pressures will drive the price back down to the equilibrium price. Conversely, when price is below equilibrium normal market pressures will drive the price back up to the equilibrium price. Given that producers do not know precisely where the equilibrium price resides over any given period of time, it can become a process of experimentation with producers changing prices until 'the right' price is achieved. This is often seen in fruit and vegetable markets around cities and towns, particularly towards the end of the day when impending shortages or surpluses become evident.

Price below equilibrium

When the market price is set *below* the **equilibrium price**, such as at \$2.00 in our market for green smoothies, there will be a **shortage** of 60 smoothies per day. You will notice in Table 2.5 and Figure 2.5 above that at this low price, only 70 smoothies are supplied, but 130 smoothies are demanded, which means that only 70 smoothies will be traded at a price of \$2.00. The price may be set at this level because the suppliers have entered a new market and are trying to ascertain buyer response. They may not know what a good price would be in order to clear the market. It will soon become evident to the supplier that the price they are charging is too low because they will run out of stock relatively quickly (resulting in a shortage). The supplier is then likely to take advantage of this by raising the price in order to maximise profits. In some markets, the buyers may actually try to outbid each other to obtain the scarce products. As the price of the smoothies rises, some buyers will decide to leave the market because they are no longer willing or able to purchase the smoothies. The higher price will also act as an incentive for the suppliers to make more smoothies available to the market. Some entrepreneurs may notice that there is money to be made in green smoothies and may enter the market for the first time. This will be represented by movements along the demand (contraction) and supply (expansion) curves, as the price rises. This price will therefore continue to increase until the shortage is eliminated and the quantity demanded is equal to quantity supplied at \$4.00 per smoothie. This is clearly demonstrated in Figure 2.6 below.

Price above equilibrium

If the price is initially set *above* the equilibrium price, the market will also move naturally towards its equilibrium. If, for example, the price was set at \$6.00 then the suppliers would notice that they are not generating enough sales. Table 2.5 and Figure 2.5 show that, at this high price, 110 smoothies are supplied, but only 50 smoothies are demanded, which means that 50 smoothies will be traded at a price of \$6.00. The suppliers may have overestimated the amount that people will pay for green smoothies and have set the price too high. This would create a **surplus** of 60 smoothies (quite a waste of resources), which should encourage suppliers to lower their selling price and entice new customers into the market. (This is often the motivation for stores who conduct regular sales to offload stock where prices were initially set too high.) When the price is lowered, however, it gives a clear signal to potential suppliers in the market that this product may not be as profitable as it first appeared. As a result, supply is likely to contract as the price falls and some manufacturers or retailers will decide to allocate their scarce resources to relatively more profitable areas. The price will continue to decrease (encouraging demand to expand and supply to contract) until there is no reason for suppliers to alter it, which means that the market has reached a state of equilibrium. This analysis is highlighted in Figure 2.6.



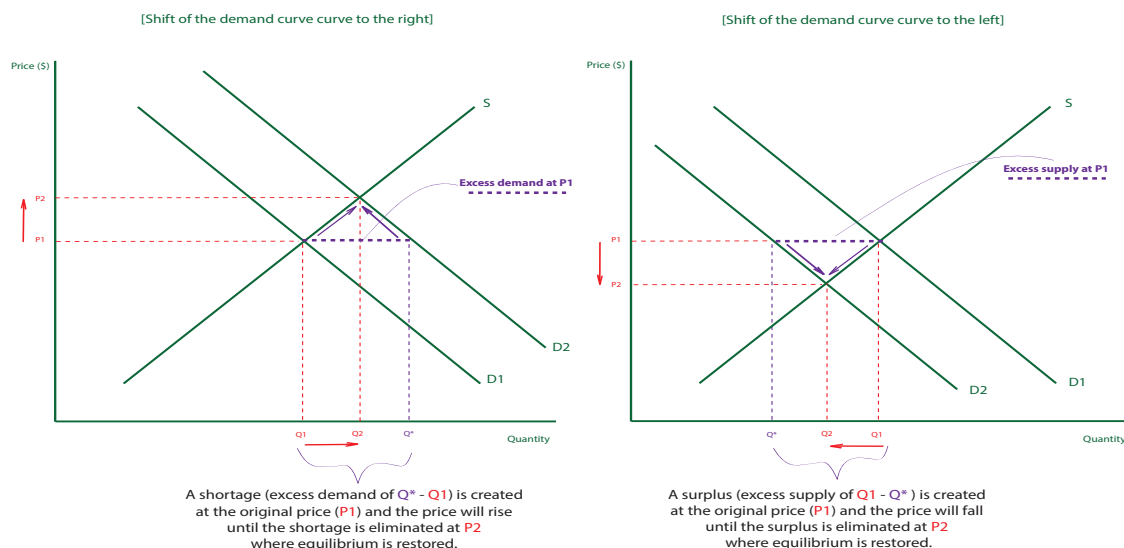
2.8 The effects of changes in supply and demand on equilibrium prices and quantities traded

When the market is in equilibrium, there is no pressure for price to change unless there is a change (or shift) in demand and/or supply such that one or both of the curves move to a new position. As noted in sections 2.4 and 2.6, the factors of demand and/or supply can change at any point in time. In each of these cases, the market will be in a state of disequilibrium, with the price either being too high or too low, and where surpluses or shortages will develop. Over a period of time, the market price will adjust to eliminate surpluses or shortages and equilibrium will eventually be restored. For example, an increase in the price of a substitute will generally result in an increase in demand for the cheaper product at all price points. This would be represented by a shift of the demand curve to the right for these products, which may result in a new set of equilibrium prices and quantities traded. Consider the following examples:

Changes in demand while supply remains constant

Suppose demand increases for green smoothies because the government undertakes an extensive campaign to encourage citizens to eat more green vegetables. Governments may be motivated to do this due to the rising healthcare costs across the country and consequently many people believe what they hear in the campaign. For some people, eating green vegetables is just too much to bear so they turn to the next best thing – green smoothies. This results in an increase in the demand for green smoothies at all price points, which is represented by a shift of the demand curve to the right. This is shown in the first diagram in Figure 2.7 below. The initial increase in demand causes a shortage at the original price (the suppliers may not have expected such a response from their customers). The popularity of the green smoothies may therefore encourage the suppliers to increase the price and/or the customers to compete against each other to obtain the scarce smoothies. Therefore, as the price rises, the higher price alters the incentives for both the consumers and the producers. Some of the original increase in demand may contract as the price increases (some people may not be able to afford the smoothies), but the higher prices will act as an incentive to supply more, so supply expands. The end result is a higher equilibrium price and quantity traded for green smoothies.

Figure 2.7:
Disequilibrium caused by a shift of the demand curve

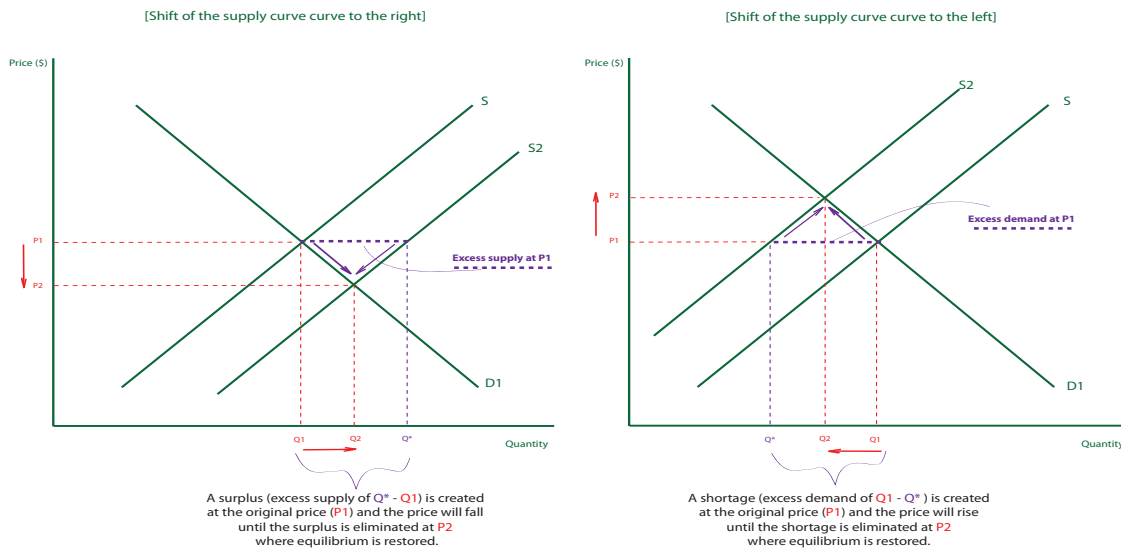


Similarly, the demand for green smoothies may decrease. This may be caused by an increase in variable interest rates (indebted households would have less discretionary income to spend on smoothies), causing the demand curve to shift to the left. This is shown in the second diagram in Figure 2.7. When the demand curve shifts to the left, fewer smoothies will be demanded at each price level. This will initially create a surplus at the existing price and sellers will most likely conduct a sale and lower their prices. In doing so the surplus may be removed and some suppliers will realise that the profitability of this market has fallen so will contract their supply (and some may leave the market altogether). They may decide to pursue other, more profitable, areas of production. The new equilibrium price is therefore lower and the quantity traded also falls.

Changes in supply while demand remains constant

Supply may increase due to technological advancements, for example, that makes it cheaper to produce each smoothie. This will result in an increase in the quantity supplied at each price level and is represented by a shift of the supply curve to the right. This is shown in the first diagram in Figure 2.8 below. The shift to the right will generally result in a surplus of stock available at the initial price. A surplus of stock creates the need for the seller to lower the price. By lowering the price new customers are drawn to the market (demand expands) and at the same time the supply contracts because firms realise that it is no longer possible to sell the smoothies at the previously high price. The increase in supply results in a lower equilibrium price and an increase in the quantity traded.

Figure 2.8: Disequilibrium caused by a shift of the supply curve



Conversely, a decrease in supply will result in a decrease in the quantity traded and a higher equilibrium price. This is shown in Figure 2.8. An increase in the cost of oil, for example, will have an impact on most goods and services consumed. The oil is used as an input in the production of conventionally-produced green vegetables (as a component in fertiliser), as well as in the transportation of the final product to the retail outlet. Therefore, less will be supplied at each price and the supply curve will shift to the left. The shortage that is created at the initial price will affect how the producers and consumers behave in the market. It is likely that those who really want the scarce smoothies will bid up the price and some consumers will therefore leave the market as they are no longer willing and/or able to purchase the product. The shortage will also be eliminated by an expansion of supply as some suppliers see the added profitability from supplying more. These dynamics are summarised in Table 2.6.

Table 2.6 Impact of changes in demand and supply		
Change in demand	Change in supply	Impact on market
Increase	Unchanged	P increase, Q increase
Decrease	Unchanged	P decrease, Q decrease
Unchanged	Increase	P decrease, Q increase
Unchanged	Decrease	P increase, Q decrease

There are also four more complicated scenarios. Sometimes the factors of demand and supply can both change concurrently. This can happen when a factor of demand happens to also be a factor of supply. For example, a decrease in interest rates will affect both the demand and supply curves for green smoothies. The lower interest rates will mean that indebted households will have more discretionary income to spend on a range of goods and services (such as green smoothies). This would shift the demand curve to the right. At the same time, the lower interest rates will tend to reduce the cost of production for firms who operate with some level of debt. [Even if firms have no debt, it reduces the opportunity cost of allocating the funds to the green smoothie business]. Their supply curve will therefore shift to the right. When the demand curve and the supply curve both shift to the right this will lead unambiguously to an increase in the quantity traded (because both demand and supply are increasing). However, the changes in demand and supply have conflicting effects on the price offered in the market. It may, at first glance, seem impossible to determine what impact this will have on the price of green smoothies. Further knowledge of the degree to which consumers and

suppliers respond to changing interest rates is needed to make a meaningful prediction. The price change will depend upon whether changes in interest rates will have a bigger effect on consumers or producers. At this stage, we would therefore suggest that the change in price is unknown.

Given that many producers may not be operating with debt and producers are unlikely to pass on any savings in a climate of higher demand, it is more than likely that the prices for green smoothies will increase. It is therefore assumed that the demand curve will shift to the right by more than the supply curve. This may also depend on other factors such as the level of confidence in the economy, the degree of spare capacity and the price and income elasticity of demand. The four more complicated scenarios are summarised in Table 2.7. This table highlights that when both curves shift, there will be one of the two parameters (price or quantity) which is difficult to determine (expressed as 'unknown') and further knowledge of the individual market will be required to reach a definite conclusion. In reality, the predicted result may not eventuate as a number of other factors may influence how the market reacts (remember these other factors are held constant for the purposes of our analysis but in reality, they are always changing).

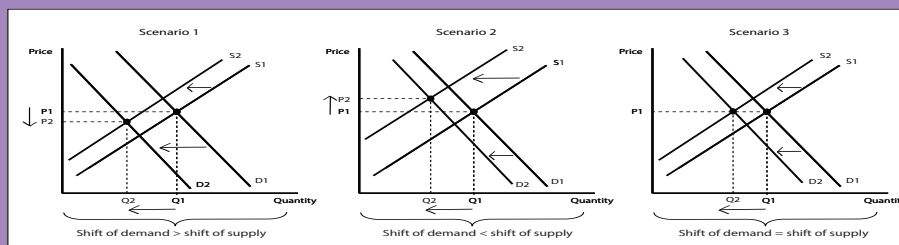
Change in demand	Change in supply	Impact on market
Increases	Decreases	P increase, Q ?
Decrease	Decreases	P ?, Q decrease
Increase	Increase	P ?, Q increase
Decrease	Increases	P decrease, Q ?

Box 2.2 Shifts of demand and supply

Assume that there is a change in tastes and preferences that causes smoothies to go out of favour. At the same time, the cost of hiring labour increases. If the change in a demand and a supply factors are illustrated on a suitably labelled supply and demand diagram, both curves will shift to the left but there are three possible market outcomes:

- Scenario 1 – the demand curve shifts further to the left than the supply curve. In this case, the price will decrease, and the quantity traded will fall.
- Scenario 2 – the demand curve shifts to left by a smaller distance than the supply curve. In this case, the price will increase, and the quantity traded will fall.
- Scenario 3 – the demand and supply curve shift by a similar distance such that the equilibrium price remains unchanged and the quantity traded falls.

These three scenarios are depicted in the diagrams below.



Notice how the change in price depends upon the relative changes in demand and supply. This reflects the fact that the fall in demand places downward pressure on prices but the increase in costs of production (which reduces supply) place upward pressure on prices. Without further analysis it is hard to determine the final impact on prices. We have a high degree of confidence that given both curves are shifting left, the quantity traded will fall. Therefore, it can be concluded that the change in the quantity is negative but the change in the price cannot be definitively determined without further analysis of the relative changes in demand and supply. If faced with a scenario like the one described above, it would therefore be appropriate to state that the change in price is 'unknown'.

Activity 2e: Making predictions using demand and supply diagrams

For each of the following examples, use a fully labelled demand and supply diagram to illustrate the impact on the equilibrium price and quantity. You should also provide a written explanation of your response, which makes reference to the relevant demand and/or supply factor and how the market returns to equilibrium from disequilibrium.

1. The impact of a flood on the market for zucchinis
2. The impact of an increase in the price of bananas on the market for apples.
3. The impact of an increase in the price of record players on the market for records (vinyl).
4. The impact of an increase in the number of children born on the market for baby formula.
5. The impact of a decrease in the price of oil on the market for perfume.
6. The impact of a decrease in interest rates on the market for housing.
7. The impact of a depreciation of the Australian dollar on the market for DJ equipment (assume all machines sold in Australia are imported).
8. The impact of an increase in teachers' wages on the market for education.

Review questions 2.4

1. Define what is meant by the term 'equilibrium'. Explain why the equilibrium price is seen as a compromise.
2. Explain how the market for smoothies would return to equilibrium, if the price was initially set above the equilibrium.
3. Explain how the market for smoothies would return to equilibrium, if the price was initially set below the equilibrium.
4. Explain how the market for smoothies would be affected by an increase in consumer confidence and describe how the market would move towards a new equilibrium.
5. Explain how the market for smoothies would be affected by favourable weather conditions and describe how the market would move towards a new equilibrium.
6. Explain how the market for smoothies would be affected by higher interest rates and describe how the market would move towards a new equilibrium.
7. Explain how the market for smoothies would be affected by an increase in the wages paid to the workers in the smoothie shop and describe how the market would move towards a new equilibrium.

Activity 2f: A visit to the market to purchase green apples

At the Queen Victoria Market (QVM) there are a large number of fruit and vegetable sellers, each selling Pink Lady apples. Consumers are able to easily compare prices between the sellers and the price paid to rent a stall is relatively low. Assume that an economist has conducted some detailed market analysis of apple sales and that she has determined that the demand and supply for Pink Lady apples in a given week is as provided in the following schedule:

Price per kilo (\$)	Quantity demanded (kg)	Quantity supplied (kg)
\$0.50	100,000	55,000
\$1.00	90,000	60,000
\$1.50	80,000	65,000
\$2.00	70,000	70,000
\$2.50	60,000	75,000
\$3.00	50,000	80,000
\$3.50	40,000	85,000

- a. Using the above information, construct a suitably labelled demand and supply diagram.
- b. Use your diagram or the above schedule to determine the equilibrium price and quantity determined in the market.

Imagine that the QVM was featured on a high rating cooking show. This provided the people of Melbourne with valuable information about how the prices at QVM are very low and the atmosphere is amazing. This led to a change in the market outcomes in the following week as shown below:

Price per kilo (\$)	Quantity demanded (kg)	Quantity supplied (kg)
\$0.50	120,000	55,000
\$1.00	110,000	60,000
\$1.50	100,000	65,000
\$2.00	90,000	70,000
\$2.50	80,000	75,000
\$3.00	70,000	80,000
\$3.50	60,000	85,000

- c. Update your demand and supply diagram to show how the equilibrium price and quantity has changed.
- d. With reference to a relevant demand or supply factor, explain how the free promotion on the television program led to a change in the market outcome for Pink Lady apples. Make sure you describe how the market moved from disequilibrium to equilibrium.

Due to the increased popularity of the QVM, there is more competition for stall space. In response to this, the management of QVM increases the rent charged to stall holders. This results in a decrease in the ability to supply at each price level by 10,000 kg per week.

- e. Use your demand and supply diagram and/or the schedule to determine the new equilibrium price and quantity traded (assume that the conditions in part c are maintained).
- f. Predict what might happen to the equilibrium price and quantity traded for Pink Lady apples at QVM based on the following changes in demand and/or supply conditions.
 - I. A week in summer where the temperature is above 35 degrees everyday
 - II. An increase in prices charged for parking around the QVM
 - III. A shortage of Fuji apples
 - IV. A lack of frosts in the apple growing season due to climate change
 - V. A decrease in the price of petrol
 - VI. A decision by the Melbourne City Council to renovate the QVM

Extension: Organic apples are grown without the use of synthetic fertilisers, herbicides or pesticides. There are only three sellers of organic apples at the QVM. Most apples sold at the QVM are referred to as 'conventional' which means that artificial chemicals are used in the production process.

- g. With reference to relevant factors of demand and supply, explain why the price of organic apples is sometimes 'twice the price paid for conventional apples.'
- h. Explain why apples sold at the QVM are generally cheaper than the price paid in the major supermarkets.
- i. Explain why the price of apples falls at the QVM at the end of each day of trading.

Activity 2g: The market for new cars

In a small country such as Australia, with a population of approximately 25 million, it is often a surprise to many commentators that people buy so many new cars. In 2017/18, approximately 90,000 new cars were sold each month (which is more than 1 million new cars annually).

The car market is far from a perfectly competitive market. There are generally a few large car manufacturers around the world who control a large share of the market. Each car is also highly differentiated and there are very high barriers to entering this market (due to high set up costs and the difficulty in attracting new customers who may have developed brand loyalty for the existing brands). Even though the market does not fit a perfectly competitive market, it is still possible to use the models developed in sections 2.3 through 2.7 to analyse the factors that could affect the demand for and supply of new cars.



For many people, the purchase of a car involves some level of debt financing. It is therefore not surprising that the Federal Chamber of Automotive Industries quoted interest rates as a significant factor that can affect car sales. A decrease in interest rates lowers the total cost of purchasing a car, as less interest has to be paid back to the lender over the course of the loan. To attract new customers, many dealers have been offering interest rates that are sub-zero. The purchaser is likely to compare the repayments on the loan to their monthly income and the lower rates might encourage new entrants into the market.

The market has also experienced changes in tastes and preferences with a 30% increase in small SUVs (compared to a very small 1% growth across all vehicles) over the twelve-month period leading up to July 2018. The popularity of these vehicles is attributed to a significant change in tastes and preferences as traditional passenger vehicles such as the Holden Commodore experienced a 44% decline over the same time period. Sales of diesel vehicles also peaked in 2017, with some manufacturers reducing the number of diesel vehicles offered for sale. Some car market analysts attribute this fall to Volkswagen's decision to cheat on the emissions tests, increasing the public's suspicion surrounding the safety of diesel vehicles. The news also encouraged European officials to impose tougher standards on emissions from diesel vehicles.

When the July monthly car sales figures for 2018 were compared to the same month the previous year it was discovered that there was a 7.8% decline. Car dealers were, not surprisingly worried by the rapid decline in sales and this resulted in heavy discounting across a range of vehicles. As economists, we seek to understand changes in markets and there are a number of significant factors that could explain the declining sales.

Factor 1 – Falling house prices

In 2015, the Reserve Bank of Australia published an analysis of the car market that suggested that a 1% increase in house prices resulted in a 0.5% increase in new car registrations. The RBA associated this increase in sales with a the 'wealth effect'. Increases in house prices tend to increase the wealth (total stock of a household's assets less any outstanding debt) because the amount that households owe on their house tends to decrease over time but the price for which houses can be sold increases. The increase in wealth has a positive psychological effect and may encourage households to increase their exposure to debt. The increased equity (the amount of the home that they own) may also increase the capacity to borrow because banks will allow people to borrow a certain percentage of the value of the home (up to 80% is their preference). In the year ended June 2018, house prices across Australia declined by approximately 1%. In cities with the steepest declines (such as Sydney where house prices fell by 4.5% over this period), new car sales fell by nearly 10%. Such a large fall NSW's largest city has a significant influence on total car sales across Australia, given the state's large population.

Factor 2 – Slow wages growth

Australia is experiencing slow growth in wages. Average wages grew over the twelve months to June 2018 by only 2.1%. Given that the inflation rate was also 2.1% this means that for most households, real disposable income is not rising. A lack of growth in disposable income may encourage some households to hold onto their existing vehicle for a longer period, contributing to the fall in sales figures for new vehicles.

Factor 3 – The depreciation of the AUD

All new cars sold in Australia are now imported, following the closure of all domestic car manufacturing plants. This means that the prices paid for the vehicles are influenced by the value of the currency. The Australian dollar (when expressed in terms of the USD) has depreciated by approximately 10% over the 12 months ending June 2018. This means that the dealers who import the cars may have to exchange more AUD to purchase the new vehicles from foreign manufacturers (assuming all other factors remain the same). This effectively increases the cost of production, shifting the supply curve to the left and resulting in higher prices and a contraction of demand.

Questions

1. Discuss how the market price for cars would be determined.
2. Explain how discounted interest rates, offered by car dealers may affect the sales of new cars in Australia. Illustrate this effect on a fully-labeled demand and supply diagram.
3. With reference to a relevant demand and supply factor, explain why sales of diesel vehicles have declined by a greater percentage than sales in the petrol or electric car markets.
4. Explain how increased oil prices may have affected the market for new cars. Discuss both the demand side and supply side effects, and illustrate the overall effect using a fully-labeled supply and demand diagram.
5. Explain how falling house prices might have affected the sales of new vehicles.
6. Explain the link between slow wages growth and the equilibrium price and quantity traded for new vehicles.
7. Explain why the depreciation of the AUD may have contributed to the declining sales of new vehicles. Illustrate the effect of this factor on a suitably labelled demand and supply diagram.

2.9 The effect of relative prices on resource allocation

Resource allocation is the study of how resources such as land, labour and capital are directed towards the production of goods and services to meet the needs of households, businesses, governments and other economic agents. We can consider resource allocation by returning to the three basic economic questions considered in the Chapter 1.

Economists are interested in **'What'** goods are produced. Therefore, they want to know where the resources are being directed in terms of production. For example, we may want to ask the following sorts of questions:

- Why is the country using its labour resources to produce mineral exports rather than to manufacture shoes?
- Why have scarce resources been moved from mining to more service-based industries in recent years?
- What will happen to the allocation of resources as the earth's climate systems become increasingly disrupted?

Study tip

Most markets in Australia are interconnected. It is possible to make links between seemingly unrelated markets if one is prepared to investigate far enough. For example, any change in one market will affect labour and other factor markets for substitutes and complements as well as financial markets.

Economists may also be interested in **'How'** resources are being used in the production process. In a free market, it is assumed that self-interested firms (who are motivated by profit) will try to minimise their costs of production and offer the best product they can in their chosen market. This may mean that they seek the most efficient way to convert their land, labour and capital into the end product. We might consider the following:

- How will you allocate your scarce resources in response to perceived changes in labour market conditions in the future?
- How will the invention of more sophisticated artificial intelligence affect the mix of labour and capital in the production process?
- How can community pressure influence the methods of production employed by firms in a country?

Finally, economists will look at how the products that are made are ultimately distributed in the economy - in other words, **'Who'** gets to enjoy the goods and services that are produced. In a purely market capitalist economy, markets will typically allocate resources to those who are willing and able to pay. Given that no market in the world is completely market capitalist, it is not surprising that the predictions that may be made by our model may not eventuate. However, in a country like Australia, the market mechanism is a very useful model that can provide consumers, businesses and other economic observers with the capacity to predict changes in prices and quantities (as well as explain retrospectively why these parameters may have changed). With respect to this question we may consider:

- What influences the wages paid to different professions?
- How does the scarcity of labour affect the allocation of the world's scarce resources?
- How do the buying decisions of the very wealthy affect the ability of the low income earners to access necessities?

Markets are able to reveal information about consumer preferences because consumers willingly exchange their income for those goods and services that they believe will maximise their wellbeing. These buying decisions are very instrumental when it comes to the way a nation allocates its scarce resources. The ability to make free choices shows producers what consumers value, their priorities and preferences. Ultimately, the value of any good or service is determined by the buyer's willingness to pay (demand) relative to its availability (supply). The price is therefore used to ration the scarce goods and services to the point where the market will allocate resources to the highest 'end use'. Most economists would argue that utilising the market to allocate resources leads to the most efficient outcome (that is, society's wellbeing is more likely to be maximised). The link between market outcomes and efficiency will be discussed in detail in Chapter 3.

Across the economy there will be a set of prices for every good or service that is offered for sale. Economists are not only interested in the price of individual goods and services but also **relative prices**. The relative price is seen as the price of any one good or service measured in terms of the price of another good or service. This usually involves dividing the price of one good by the price of another. It is therefore a measure of opportunity cost (which was discussed in Chapter 1), as the relative price of one good can be expressed in terms of what is given up to obtain the other. For example, if the price of Vitamin Water is \$2.50 per bottle and the price for a green smoothie is \$5 (the new equilibrium as determined in our previous example), then the relative price is $\$5/\2.50 or 2:1. For every green smoothie that is purchased, the consumer foregoes the opportunity to purchase and enjoy 2 bottles of Vitamin Water. Alternatively, for every bottle of Vitamin Water that is purchased, the opportunity cost is 0.5 green smoothies.

Markets are usually dynamic places and, as we have seen earlier, the factors of demand and supply frequently change, so the relative price could change at any time. For example, if the costs of producing Vitamin Water fall, and it leads to a fall in the price to \$2, the relative price becomes \$5/\$2, leading to a ratio of 2.5:1. Therefore, to obtain one green smoothie, the consumer must now give up 2.5 bottles of Vitamin Water. Even though the price of the smoothies has remained unchanged at \$5, it has become relatively more expensive in terms of the price of what else could be bought. The higher relative price of smoothies is likely to cause a fall in demand at each price level given that there is a degree of substitutability between Vitamin Water and green smoothies.

With respect to the question of **what to produce**, an economy that relies on the market mechanism will generally allocate resources to those goods that are in high demand. When the relative price of a good or service increases due to an increase in demand (and/or a decrease in supply), this sends a clear signal to economic agents. A supplier may see the price movements and decide that it is now more profitable to use their resources to produce that good or service. Consumers are therefore said to be the main driver of resource allocation in the market-based economy. For example, if there was an increase in the price of oil (which peaked in 2007) then people may look for cheaper forms of transport such as scooters (because they use less fuel). This will result in an increase in the demand for scooters (the demand curve shifts right) and this would create a shortage of scooters at the existing price. The shortage will encourage some potential buyers to bid up the price and existing suppliers will take the opportunity to raise the price. The price of scooters has now risen relative to other forms of transport (such as cars), which indicates that this is an area of production providing greater profit opportunities. Producers will therefore decide to allocate more land, labour and capital to the production of scooters. At the same time, the higher oil prices encourage suppliers to seek out new energy sources, which leads to increased exploration and the development of new methods of oil extraction. For example, the high oil prices provided energy companies with the incentive to aggressively develop the process of fracking, resulting in further changes to the way resources were allocated in the world economy. See Box 2.3 for further examples of changes to relative prices and the impact on resource allocation in the energy sector.



The price mechanism describes how the forces of demand and supply determine relative prices of goods and services, which then ultimately determine the way our productive resources (e.g. labour and capital) are allocated in the economy.

The price mechanism will also influence the second fundamental economic question of **how to produce** the good or service. Generally speaking, a business will seek to maximise its profits by minimising its costs and selling the good or service at the highest price possible. The competitive market will ensure that resources are used as efficiently as possible so that producers can offer their product at the most attractive price to the consumer. Therefore, when the price of one resource increases relative to the price of another, this may influence firms to change the way they produce their goods and services (and in the process alter the allocation of resources). For example, if unions are successful in raising wages of unskilled labour, this increases the price of labour, relative to capital, and may cause some substitution out of using labour and into using capital in the production process. The relatively high price of labour (when compared to capital) offered to unskilled labour in Australia, may have encouraged the supermarket industry to implement self-serve checkouts, which decreases the need to hire as many workers. Higher labour prices in Australia have also encouraged many firms to shift their manufacturing (and sometimes service) activities to countries with cheaper labour. For example, most clothes and technology products are not made in Australia because the relative price of labour is too high and resources are allocated to alternative products where the value-added might be higher.

Similarly, the price mechanism will effectively allocate resources within factor markets themselves, with changes in the relative prices for factor inputs sending clear signals to the owners of these resources about how best to use their resources in production. For example, in **labour markets**, the shortage of engineers over recent years has resulted in a higher price for engineers (i.e. the wage or remuneration), relative to the price for other professions, which has sent a signal to people, such as university entrants, that a career as an engineer is relatively more lucrative. This is likely to lead to a greater allocation of labour resources to this particular section of the labour market. In other words, there will be greater supply of engineers to this market as the price (or wage) of engineers has increased relative to the price offered in other professions. Again, the price mechanism has facilitated this movement of (labour) resources from one activity to another.

The answer to the third fundamental question of for **whom to produce** is determined by the potential consumers' willingness and ability to pay. Resources will usually be allocated to the production of goods and services that are demanded by the consumers, but some consumers will be able to access more goods and services than others. More land, labour and capital resources may therefore be devoted towards satisfying the material needs of the high-income earners in our society because they can afford to purchase more goods and services. Therefore, the relative wages of

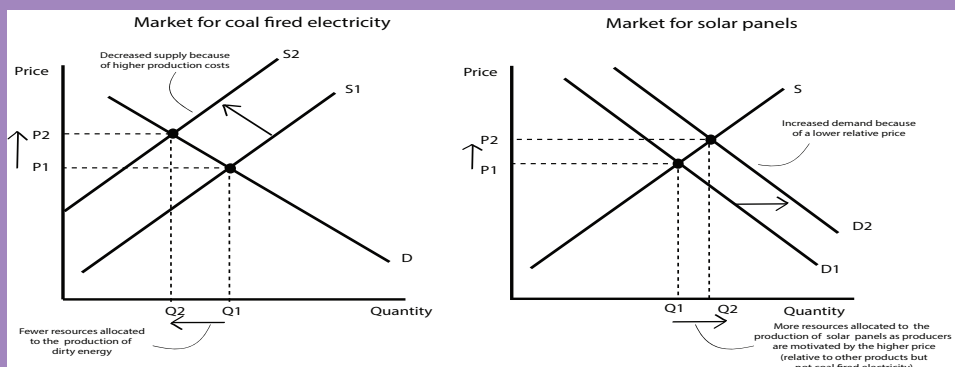
different professions will ultimately influence who gets to consume the resources available in a country (or the world at large). In a free market, this could mean that a large section of the population live without access to basic needs and could live below the poverty line. For example, there is an increasing number of Australians who do not have access to affordable housing. The inability to earn enough income in the market system significantly reduces their capacity to obtain a loan or successfully apply for a rental property. The activities of investors in the market (which have contributed to significant increases in prices) have also made it more difficult for people from younger generations to purchase a property.

Generally speaking, those goods and services that are profitable to produce in a competitive market will be produced and those that involve making a loss will not. However, governments will intervene to promote what is perceived to be a more efficient allocation of resources if there is evidence that the market has failed. Some of these instances are investigated in Chapter 3. The government will also reallocate resources when equity in the distribution of income is not achieved. This is based on society's preferences to support those who may not have the ability to achieve a dignified standard of living.

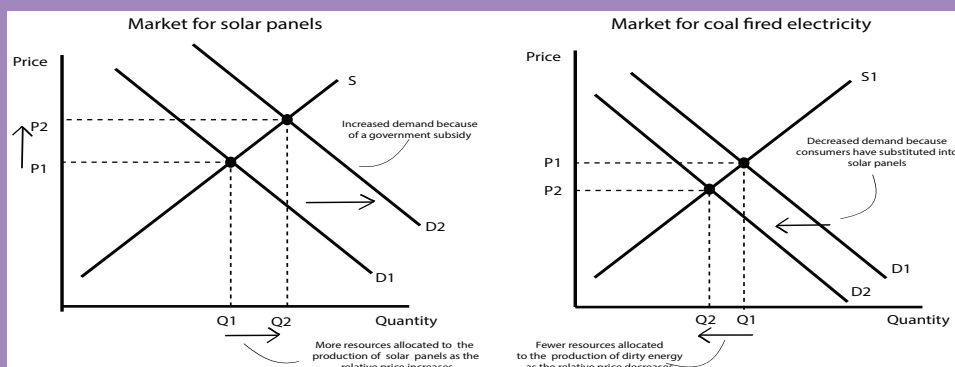
Box 2.3 Examples of relative prices and resource allocation in the energy sector

The introduction of the carbon tax from July 2012 (albeit for only two years) also influenced the structure of relative prices. The carbon tax was imposed on the country's largest carbon emitters and it resulted in an increase in the price of carbon intensive products, such as electricity produced at coal-fired power stations. The supply curve for coal-fired electricity shifted to the left, and the price of coal-fired electricity increased relative to the price of installing solar panels. This then raised the demand for solar panels (shifting the demand curve to the right) and resulted in a higher equilibrium price for solar panels. As a result, producers noticed the higher 'relative price' of solar panels (compared to other goods that they might wish to produce), and allocated more resources to the production of solar panels. The higher price of electricity generated from coal led to a contraction along the demand curve for coal generated electricity and less coal resources were ultimately utilised within Australia to make electricity.

Interestingly, a carbon tax (or carbon pricing more generally) both increases and decreases the relative price of solar panels, providing important signals to economic agents and helping to explain why and how resources are allocated in response to price signals. First, the relative price of solar panels will fall when compared to coal-fired electricity, encouraging demand to move away from the carbon intensive form energy production of burning coal, and toward less carbon intensive forms of energy production. Resources will therefore shift out of the production of coal-fired electricity. Second, the relative price of solar panels will rise when compared to other products (because the increase in demand will cause shortages at the original price), resulting in more resources flowing to the production of solar panels. After a period of time, the price of solar panels will again fall, because the larger market encourages both new suppliers to enter and the development of better technology to make the panels. This change in resource allocation is summarised in the diagrams below.



In 2018, the Victorian Government introduced a new subsidy scheme for median and low-income households, offering to pay for up to half of the purchase price of solar panels or storage batteries. This changes the allocation of resources, as the subsidy (subsidies are considered in detail in Chapter 3) reduces the amount that consumers will need to spend on purchasing solar panels and causes the demand for solar panels to increase at the expense of coal fired electricity (i.e. consumers substitute away from coal fired electricity and into solar panels). The higher demand for solar panels causes the relative price of solar panels to rise and encourages producers to allocate more resources to their production. The lower demand for coal fired electricity would eventually see fewer resources allocated to its production over time. This change in resource allocation is summarised in the diagrams below.



[Note: that normal sloping demand curves have been drawn for ease of illustration but in reality the curves are likely to be steeper (see 'price elasticity of demand' later in the chapter). In addition, to simplify the analysis, the original starting price for solar panels and coal fired electricity is assumed to be the same at P1. In reality, the relative price of solar energy is currently higher.]

2.10 The effect of relative prices on living standards

What do economists mean when they discuss living standards?

Throughout this book, there will be regular reference to the concept of living standards. This is an important consideration for economists when decisions are made and is seen by many to be the ultimate aim of all economic (and other) decision making. Governments will alter their policies to achieve what they hope will be an increase in living standards. It is therefore worth considering briefly what is meant by this term and how it might be measured. This will be discussed in greater detail in Chapter 4.

Generally speaking, a study of **material living standards** looks at the ability of households to access (in most cases this means purchase) goods and services. The easiest way to measure this is to examine real GDP (or income) per person (capita). This gives us a general view of the purchasing power of the average individual in a country. We can also use **real GDP per capita** as the basis of comparison between countries (after adjustment for exchange rates and purchasing power are made), although statistics between countries may be difficult to compare due to the reliability of data.

Measuring living standards by access to goods and services alone is somewhat limited, however, as it does not recognise and explore all of the factors that add to a person's quality of life. There is a growing body of economists and reviewers of economic thought who have questioned the modern focus on material consumption (especially when compared to how traditional societies functioned). The dominant belief has been that increased access to material possessions and experiences should make us happier, and we have built our economies around this assumption. There are, however, a range of factors that can affect a person's quality of life which may not be related to the size of their income. These are often gathered together under the umbrella term '**non-material living standards**'. Social scientists have concluded that the quality of human relationships has a strong correlation with a person's quality of life. Strong social networks are generally associated with lower crime rates, better child welfare and public health. A society that is democratic, supports equality across sexes and minority groups seems to be happier. It has also been shown that people in committed relationships have higher levels of happiness and life expectancy. Some people may experience higher standards of living when they spend more time alone while others thrive on time spent with others. The complex nature of non-material living standards (which differ for each person) makes it very difficult to measure. Any assessment of a policy decision or an analysis of the impact of market on non-material living standards will invariably be incomplete. Nonetheless, there is a recognition that these non-material factors do indeed influence our quality of life and hence our 'standard of living' and thus are also considered when discussing living standards.

The market, relative prices and living standards

The **market mechanism** has been adopted as the primary method by which many countries around the world allocate scarce resources. It is therefore seen as the most effective way to boost the living standards of people living within an economy, and in particular their material living standards. This could be linked to the idea of efficiency and the ability of an economy to maximise society's needs and wants.

Consider how the market promotes economically efficient outcomes (and therefore how this might boost **living standards**). In a competitive market, **relative prices** act as signals to producers and consumers and therefore affect the types of goods and services that are produced. The suppliers will be constantly monitoring the prices that they are offering their products for and the prices offered for both substitutes and complements and seemingly unrelated goods in the market. Changes in relative prices give the supplier the incentive to alter the types of goods and services that are produced and may also alter the way goods and services are produced.

For example, if there is an increase in demand for chocolate, this will shift the demand curve for chocolate to the right, resulting in an increase in its relative price (assuming all other factors have remained constant). This change in relative prices will give the incentive for current suppliers to expand their production because to do so will result in higher profits. The higher relative price also sends a signal to other potential suppliers that this is a lucrative market and that they could benefit from entering the market (remember that in a competitive market there are low barriers to entry which make this possible).



Activity 2h: How artificial intelligence might affect the allocation of resources

Artificial intelligence is sometimes described as machine learning. It indicates that in the future, machines (capital) will be able to increasingly complete tasks that once required physical and mental effort by humans. In particular, the machines may get better at tasks over time and can consider their operating environment and make adjustments that maximise their preferred outcomes (such as production).



Research and development in the area of AI has resulted in a number of significant developments already and many expect that driverless cars will be seen on our roads in the next five years. This, in itself, is likely to see a dramatic change in the way labour resources are allocated. When a company hires a driver (to drive a bus or taxi for example), they need to pay them a wage or salary and the worker will have a physical limit to how long they can work. With the advent of driverless cars, such companies will be able to maximise their profits by reducing their demand for labour. The question that remains is what will happen to all of the workers who are displaced by the highly intelligent vehicles.

The introduction of driverless cars may also have flow on effects to other areas of production. Some experts predict that driverless cars will reduce the number of accidents on the road. They argue that accidents are caused by human error and that the intelligent vehicles will not suffer from lapses in concentration and irrational behaviour. With fewer accidents on the road, there will be decreased demand for panel beaters and fewer resources will need to be allocated to replacement parts for those damaged in accidents. The reduction in accidents could also reduce the demand for hospital services as fewer people require medical attention. This could mean that future societies won't have to allocate as much of the government's budget to healthcare spending. The reduction in accidents could also reduce the price of car insurance - which is based, inherently, on the probability of an accident occurring and the expenses associated with compensation.

The farming industry is also likely to experience change as a result of artificial intelligence. New 'smart' harvest machines will reduce the need for labour resources and farmers will be able to monitor their crops or livestock remotely.

Economic theory would also suggest that, with falling demand for a vast range of labour services, the equilibrium wage will fall. Those who are able to maintain their employment will face increasing competition from those who have similar skills and from artificial intelligence.

The predictions made by those researching the advances in AI point to a revolutionary change in the way goods and services are produced and significant modifications to the way economies answer the three basic economic questions. Humans may still demand natural products like food and water but households and businesses are also likely to want to purchase more labour saving devices. The real changes are likely to occur with respect to the question of 'how to produce' as businesses, acting to maximise their profits and maintain competitiveness will look for machines that can help to lower their costs and introduce better, less wasteful production techniques. The hardest aspect of future resource allocation to predict is the 'for whom' question. If the demand for labour resources shrink and work, as we currently know it, is completed by machines, how will people earn an income so that they can purchase all of the goods and services that are being made with the machines? One suggestion, which is the focus of much discussion around the world, is a universal basic income (UBI) whereby all people might be paid a minimum amount per week or month so that they can live above the poverty line, regardless of their employment status.

Questions

1. Distinguish between labour and capital resources.
2. Explain how the introduction of artificial intelligence may reduce the cost of production for firms and affect how they answer the key economic question of 'how to produce'.
3. With reference to the use of vehicles in the production process, explain how artificial intelligence could result in a significant change in the allocation of resources in the economy.
4. Explain why a large number of workers might find it difficult to achieve a pay rise in the future. Ensure you use demand and supply analysis in your answer.
5. Research another area of artificial intelligence and explain how changes in this area may affect the allocation of resources. Again, use demand and supply analysis and reference to relative prices in your answer.

Review Questions 2.5

1. Explain how the market will answer the fundamental economic question of 'what to produce'. Make reference to the role of relative prices in your response.
2. In a competitive market, relative prices play a very important role in allocating scarce resources. With reference to a particular example, explain how an increase in demand might result in a change in relative prices and how this influences how resources are allocated.
3. Explain how the price mechanism will cause a reallocation of labour resources in the event that there is a shortage of engineers.
4. Explain why reliance on the price mechanism will often result in an unequal distribution of income and therefore access to the goods and services that are produced.
5. With reference to an explicit example, explain how an increase in supply of a particular product may result in a change in the allocation of resources in that particular market.
6. Consider the example you provided in question 5. Explain how another (alternative) market may be affected by

8. the change in supply you described.
9. With reference to different markets to the ones used in questions 5 and 6, explain how a decrease in demand for a particular product may affect the allocation of resources in that particular market.
10. Based on the example provided in question 7, explain how an alternative market may be affected by the change in demand conditions.
11. Australia is currently experiencing a period of below average wages growth. Explain how this might be linked to the relative price of capital and the price of labour in other nations.
12. With reference to a specific market(s), explain how an increase in demand may affect a factor market(s).
13. Explain why a competitive market is likely to promote allocative efficiency.
14. Explain why a competitive market is likely to promote technical efficiency.
15. With reference to your answers for questions 11 and 12, explain how price changes in a competitive market might help to boost material living standards.
16. help to boost material living standards.
17. With reference to a specific example, explain why increased reliance on the market mechanism could lead to a deterioration of non-material living standards.

2.11 The meaning and significance of price elasticity of demand

The demand curve shows the relationship between various possible prices of a particular product and the quantities that buyers are willing and able to purchase at each of these prices. The law of demand suggests that consumers will respond to a lowering of price by purchasing more of the good or service in question.

Economists are also interested in the degree to which demand changes following a change in price. This can be studied by looking at the concept of elasticity, which considers the **responsiveness** of a change in one variable to changes in a factor that affects that variable (usually expressed as the relative percentage change in each of the variables).

One key elasticity measure is the **price elasticity of demand**, which measures the responsiveness of changes in the quantity demanded to changes in price (expressed in terms of percentage changes). A small percentage decrease in the price of a product could result in a large percentage increase in the quantity demanded, meaning that the good or service has a high price elasticity of demand. Because price elasticity of demand applies to both price increases and price decreases, a high price elasticity of demand also means that a small percentage increase in the price of a product could result in a large percentage decrease in the quantity demanded.

Price Elasticity of Demand (PED) is measured by the following formula:

$$\text{PED} = \frac{\text{percentage change in quantity demanded}}{\text{percentage change in price}}$$

By making reference to percentage changes, we can compare the degree of responsiveness across different types of goods and services. It also allows for comparisons of PED across different countries (and regions within countries) for the same types of products. It would not make a lot of sense to measure the PED in units because there would not be an explicit point of reference and it would be difficult to gauge as much meaning from the data.

When the PED is calculated, the value will generally be negative (because the relationship between price and quantity demanded is inverse). For simplicity, this negative sign is usually ignored and instead the magnitude of the change in quantity demanded is stated. Therefore the PED value can take on a value between 0 and ∞ (infinity).

Study tip

When the PED is calculated it will result in a negative value. This negative is generally ignored when examining data related to the PED.

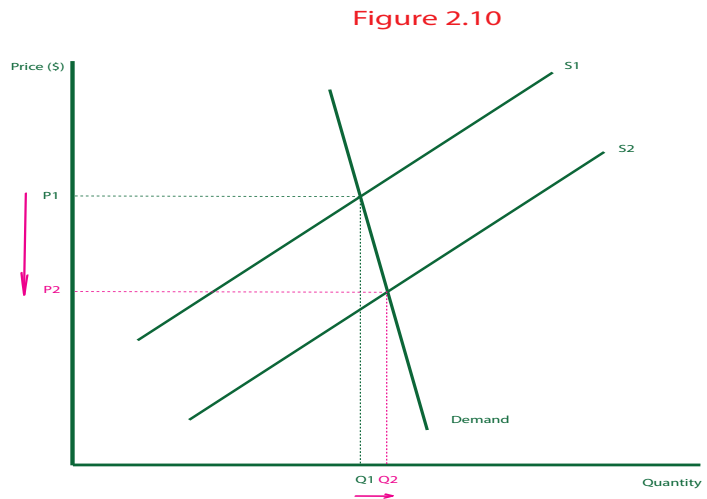
High PED (elastic)

A product will have a **high PED** if the absolute value is greater than 1. In this situation, the percentage change in quantity demanded will be greater than the percentage change in price. This will mean that if a supplier lowers their price by a certain percentage, they are likely to attract a larger percentage increase in demand. If they increase the price by a certain percentage, however, they will lose a much larger percentage in quantity demanded. A demand curve where the PED is high would be one that is relatively flat. [See Figure 2.9].

may be minimal (especially in the short run) because cigarettes have a low PED. The low PED means that they generate the highest possible tax revenue from this activity because the imposition of the tax has a relatively small effect on the quantity sold in the market.

When products with a low PED are taxed, the burden of paying the tax will usually fall on the consumer. The business knows that they can get away with passing on the tax to the consumer without too much loss in revenue. If the product had a high PED, it would be much more difficult to charge the tax to the consumer because businesses would suffer a much larger percentage decrease in sales as well as a significant decrease in revenue (and therefore profitability from the sale of this product).

In some cases, operating in a market where the product has a low PED can be detrimental. For example, primary producers are often faced with unpredictable weather patterns that can affect the supply of their products. If there was a good amount of rainfall and other favourable weather conditions, then farmers across the country could grow and offer for sale a large volume of produce. This would be represented by a shift of the supply curve to the right as shown in Figure 2.10. This might, however, lead to a decrease in total revenue. In order to sell the extra food, the farmers may have to accept the fall in market prices. The low PED means that if they lower the price, they may not see a significant boost to sales (because there is only so much food that people are willing and able to eat). They may be able to sell their products into world markets but if the whole world also has excess supply then their income is likely to fall. Figure 2.10 illustrates the minimal increase in demand caused by a small change in weather conditions (resulting in the shift in supply). Notice how much the price has to fall to clear the market - it clearly falls by a larger percentage than the growth in demand.



This can have implications for the whole economy. If an economy exports a large volume of goods and services in the primary sector, for example, then the revenue from export sales can fluctuate significantly. In recent times, the prices of commodities such as iron ore and coal have trended downwards from their peak in 2011. For a company such as BHP Billiton, the fall in the price has had a detrimental impact on their profits. The fall in price has not been offset by a significant increase in demand (because demand for these products has a low PED). In 2016, BHP went from being one of Australia's most profitable companies to being a loss-making company. Given that the Australian economy relies heavily on the sale of primary products for export revenue, fluctuations in price can have significant implications for the growth in real net disposable income and for the tax revenue that the government collects. This will be discussed further in Chapter 4.

2.12 Factors affecting price elasticity of demand

The following factors will affect whether the demand for a good or service has a low or a high PED.

The degree of necessity

Goods and services that are deemed to be **necessities** will usually have a low PED (less than 1), whereas luxury products will have a relatively higher PED. Consumers usually have less choice when it comes to the purchase of a necessity, because, by definition, they require it for their survival. If the price of bread increased, for example, the quantity demanded would decrease, but by a smaller percentage than the increase in price, as bread is a staple (and perhaps a necessary food item) for most households. Similarly, if a person is a diabetic, they are unlikely to decrease their consumption of insulin if the price increases. Therefore, both products would have a low PED.

Study tip

Although a low PED will result in a less-than-proportional decrease in the quantity demanded of a product when the price rises, it is important to remember that there will still be some decrease in demand, unless the product has a perfectly inelastic PED. Try to avoid, therefore, making statements such as 'even if the price increases, people will still buy the same amount' – as this is rarely true. The law of demand still applies meaning that when price increases, some members of the public will no longer be able to afford the relevant good or service (or they will be enticed by a relatively cheaper substitute).

Addiction can also turn a seemingly discretionary item into a good with a low price elasticity of demand. When a person is addicted to a product they may continue to buy and consume it in large quantities even if the price increases. This is one reason why the Federal Government is able to continually increase the excise tax on alcohol and cigarettes. The price for the product increases (due to a decrease in supply) but the decrease in sales is relatively small.



Luxury goods on the other hand can be foregone more easily because, by definition, they are not necessities (they are considered to be items of discretionary spending). If the price increases there is likely to be a greater percentage reduction in the quantity demanded. For example, Warren Buffet has often urged investors to steer clear of investing in the airline industry. One reason for this recommendation could be that airline travel tends to have a high PED (especially when it comes to recreational travel).

When oil prices were high, airline operators had to charge their customers a fuel levy. This essentially raised the price of a trip. With a high PED, this would have led to a more than proportionate decrease in the demand for airline travel and reduced the firms' profitability.

Availability of substitutes

Products that have a large number of **substitutes** will tend to be associated with a higher PED (greater than one). If substitutes are available, consumers are likely to switch to a close substitute quickly, when the price of a product rises. At a highly competitive fruit market, like the Queen Victoria Market, the price elasticity of demand for each orange would be very high. If one stall holder increased their prices by a small percentage they may find that they lose a large percentage of sales. Consumers would be able to compare prices easily, and there would be a multitude of suppliers to whom the consumer could turn quickly and easily. This is also a key reason that insulin has a low PED, as there are no viable substitutes. Activity 2j analyses the role of advertising in influencing the viability of substitutes. Effective advertising will decrease the viability of competitors' products since it promotes the idea that the product being advertised is unique, and therefore has few substitutes. Advertising is designed to reduce the price elasticity of demand for products.

Proportion of income

The greater the **percentage of income** that is needed to purchase a good or service, the higher the PED. If the price of a box of matches increased by 50% for example, it would be surprising to see a decrease in sales by 50%. A 10% increase in the price of a new house, however, could amount to tens of thousands of dollars which, for the average person, could be the deciding factor excluding them from the market, resulting in a larger than 10% drop in the quantity demanded.

This explains why a good can have a low PED at low prices but may turn into a product with a high PED as its price increases. Eventually, as the price of a product rises, it will reach a price where it becomes increasingly difficult to purchase the product because it takes up a larger proportion of income. It also influences behavioural change, because there is now more of an incentive to seek out substitute products, resulting in a more significant percentage decrease in quantity demanded.

Time

Over time, the PED for a product might increase. In the **short term**, many consumers tend to undertake their buying decisions in a habitual fashion. This may mean that they will not initially notice a price increase or cannot be bothered seeking out a viable alternative since they might need the product now and it is a hassle to go somewhere else to find a cheaper alternative. Over time however, consumers may notice the price increase and start to consider and try out alternative products. Consider the market for gas, traditionally used to heat the family home. An increase in the price of gas, which has occurred recently in the Australian market, may not result in a significant decline in demand, especially in the short term. The first time the household might notice the price increase is when they get 'bill shock' – when the latest bill is much higher than the previous one. They may not be able to alter their heating system in the short term but, over time, if the price hike persists, they may look for ways to decrease consumption of gas. They could install new appliances that rely on alternative sources of energy (reverse cycle air-conditioning that uses solar power) or improve insulation so that less heating is lost during the winter months. As you can see, the change in behaviour over time alters the PED such that it will be higher in the **long term** compared to the short term.



Activity 2j: Advertising to boost demand and reduce PED

Firms often spend thousands to millions of dollars per year on advertising and other forms of marketing. In terms of demand analysis, the aim of advertising is multi-faceted. The first aim of advertising is to provide information for the consumer. This might mean that the consumer now realises that a new product has come onto the market. The company will also use persuasive techniques to convince the potential consumer that their life will somehow be enhanced by purchasing and consuming the product. The company may wish to create a new market altogether or capture a slice of an already established market (thereby taking some of the market share away from an established firm). A successful advertising campaign should therefore result in an increase in the demand for the product at each given price level, thereby shifting the demand curve to the right because tastes and preferences have been altered. (Note: it will also cause the cost of production to increase and the firm will require a higher price to cover their costs).



Advertising is also designed to increase brand loyalty. Brand loyalty refers to a situation where a consumer develops positive feelings towards a particular brand and will usually make repeated purchases from the same brand over time and in different categories. Brand loyalty therefore adds to the already mentioned benefits associated with advertising. It helps to create a need for the product (this might be psychological) and also makes the competitors' products a less viable substitute. Therefore, a successful advertising campaign can decrease the PED for a product. The demand curve therefore not only moves to the right but it also becomes steeper.

A lower PED for a product will therefore allow the company to charge higher prices and gain an increase in revenue. This may help to explain why some brands, such as Apple, are able to sell their products at premium prices. The first iPhone was released in 2007. In 2018, the iPhone Xs Max was released and, as with previous releases, this was accompanied by an official launch and met with queues to purchase the phone on its day of release. The upgrade cycle is part of the marketing approach, as people who do not need a new phone (because the old one is still working) still feel some sense that they should purchase a new phone. Despite its record high price tag – the price for the 512 gig model was \$2,369 – it could be argued that Apple products have a relatively low PED. Customer sensitivity to prices is cushioned somewhat by the way phones are consumed in Australia, with most people opting for a plan that spreads the cost of the phone over 12 to 24 months. Apple also has succeeded in convincing a significant proportion of the public that their products are 'special', and that there is no viable substitute for an iPhone. Lastly, the effective advertising by Apple may convince many people that they 'need' to upgrade their phone. Apple's profit in the 2017 financial year was \$48.35 billion (USD) up from \$45.69 billion the previous year. The approach taken to product development and marketing has played a huge part in their success.

Questions

1. Explain why successful advertising spending will shift the demand curve to the right.
2. Explain why successful advertising spending will shift the supply curve to the left.
3. Define what is meant by the price elasticity of demand.
4. Explain what is meant by 'brand loyalty' and outline how advertising can generate brand loyalty.
5. Identify one other product (apart from Apple products) where brand loyalty is likely to be high.
6. Discuss the possible relationship between an increase in advertising expenditure, brand loyalty and the PED.
7. Explain why it is considered to be profit-maximising behaviour if a business raises the price on those products with a low PED.
8. With reference to at least two of the three factors discussed, explain whether the price elasticity of demand for iPhones is likely to be high or low.
9. Research what is meant by the term 'planned obsolescence'. Explain how planned obsolescence might affect the price elasticity of demand for products such as iPhones.
10. Identify one of Apple's competitors in the mobile phone market. Explain why it might struggle to attract demand even if it were to lower the price of its product.



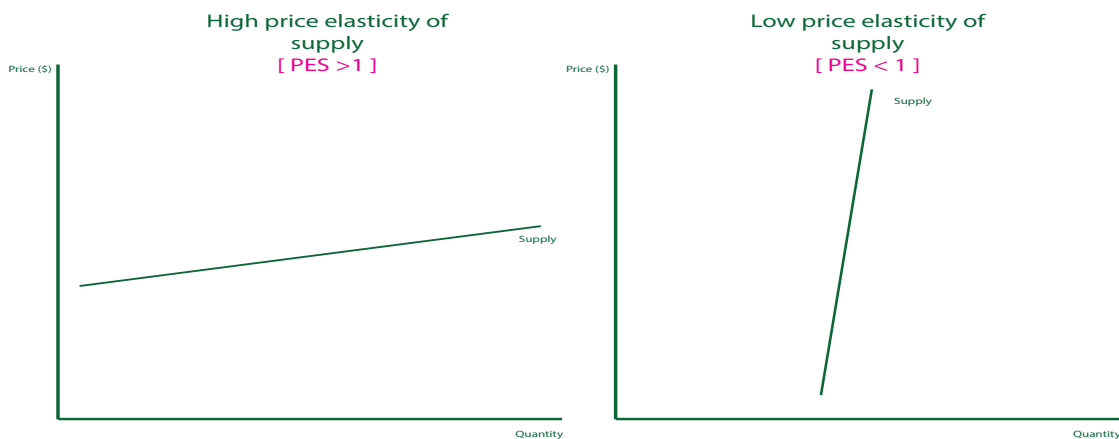
2.13 The meaning and significance of price elasticity of supply

Price elasticity of supply (PES) looks at how businesses alter their supply in response to changing prices. The PES is the percentage change in the quantity supplied of a good divided by the percentage change in its price.

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

Supply curves with a high price elasticity and a low price elasticity are depicted in Figure 2.11. A product with a PES that is greater than one will have a relatively flat supply curve. This means that suppliers are willing and able to increase the supply by a larger percentage than the price increase. If the PES is less than one, the supply curve will be relatively steep. This means that when prices increase by a certain percentage, suppliers are either unwilling and/or unable to increase supply by the same percentage.

Figure 2.11

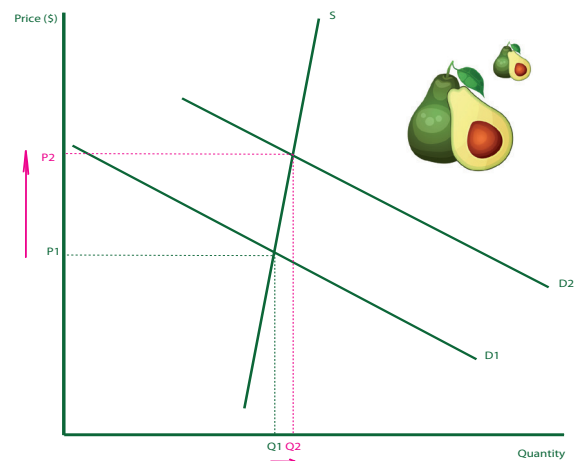


The significance of PES

The price elasticity of supply can affect the economic viability of a business as well as their ability to respond to changing price signals. Generally speaking, primary products (such as food and mining products) tend to have a lower price elasticity of supply than manufactured goods. Countries such as Australia that generate large revenue from mining and agricultural exports, often face volatile swings in the revenue they generate. For example, if prices for coal were to increase dramatically then it may be difficult for the firms to rapidly increase their output levels (especially in the short run). The low PES is also partially due to the volatility of prices in this sector. The companies need to wait for clear price signals before they undertake the investment needed to build the productive capacity necessary to meet the higher demand. Uncertainty surrounding government policy can also reduce the incentive to respond to changing price signals, especially if they, too, are perceived as temporary (given that governments in Australia can change every three years).

With a **steep supply curve**, any change in demand will result in a significant change in price. For example, the supply curve for many agricultural products is relatively price inelastic (less than one and therefore depicted as steep) owing to the fact that the production period is relatively long [See Section 2.14 on the next page.] This adds to the volatility of prices for primary producers. Any change in demand can lead to significant changes in prices. This is illustrated in Figure 2.12, which shows what happens when demand rises for a primary or agricultural product, such as avocados. In recent years, the demand for avocados has increased, causing a shortage at the original price. Given that avocadoes trees can take up to 4 years before they fruit, the PES tends to be low (in the short run) and prices can remain high for some time.

Figure 2.12

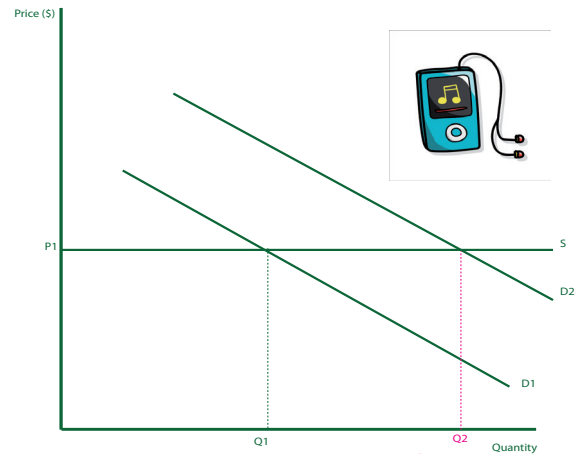


The advent of digital technologies has had a disruptive effect on both demand and supply. The disruption may be positive for some but negative for others. Consider the example of streaming services such as Netflix and Stan. Because these files can be used by any number of consumers simultaneously, the PES for this product is effectively infinite, resulting in a horizontal supply curve. Any increase in demand can be supplied instantaneously, resulting in **no shortage** and no need for the price to rise. This is highlighted in Figure 2.13.

As more products become available in a digital format (such as books, movies and games), the PES will influence the decision of producers to enter the market. If you were a potential producer, would you be encouraged to enter a market where supply could be infinite or one where it is difficult to adjust supply if the price increases or decreases? The ability to adjust supply quickly and easily (such as with the streaming services) adds flexibility to decision-making and supply response. (It does, however, in some cases, leave the company more vulnerable to piracy and therefore lost revenue).

The easy ability to increase supply also means that consumers need not worry about the product being out of stock. For example, you might hear an interview on the radio where an author discusses her new book. In the next minute you could have downloaded the book to your Kindle and be reading it straight away.

Figure 2.13



2.14 Factors affecting price elasticity of supply

The following factors will determine whether the supply of a good or service is likely to have a low or a high PES.

Production period

If prices increase for a particular product, this will give signals to suppliers that allocating resources into this area may now be more profitable. Firms may wish to increase their supply, but it may take time to attract the resources that are needed to increase production volumes. For example, if there was an increase in the demand for apricots, the demand curve will shift to the right, resulting in a higher price. The higher price will therefore act as an incentive for more apricots to be grown.

Unfortunately they cannot be produced instantly, because they require growing and harvesting. As a result, the PES of apricots will tend to be very low in the **short term**. However, the PES will increase over time as more resources can be shifted into the production of apricots (Assuming that the price of apricots remains high over time, this is likely to happen). If, however, the apricots could be stored for long(er) periods, then suppliers would be more responsive to price changes. In contrast, a song that has been written and recorded can be supplied at the tap of a button in the digital era. The production of new copies has a tiny production period, so the PES of such products is very high.



This factor highlights the importance of time for the PES.

Over time, firms will be able to respond to changing **price signals** and this will vary from industry to industry. Consider a farmer who makes his/her living from grazing cattle. Imagine how they might respond to an increase in the world price for beef. In the short term, the farmer may not be able to meet the increased demand which has caused the relative price to increase. She will also want to make sure that the price change is not temporary so may need to study the causes of the price increase (are they cyclical or structural changes that have occurred in the market?). If the price is expected to stay high, then the farmer will look to raise more cattle in the future and she will be able to respond more effectively to the higher prices. This is very similar to the situation that faced commodity miners during the mining boom that Australia experienced between 2007 and 2012.

Spare capacity

If a firm has spare capacity, then this will mean that they have some of the factors of production that are not being fully utilized (they may be idle at times). This will mean that it will have a greater ability to respond quickly to changing prices. The **underemployed labour** may be able to work more hours and machinery can be utilised to increase supply quickly. If the industry is running at productive capacity and there are **skills shortages**, this will make it hard to attract labour to expand operations. The PES for products under this scenario will tend to be relatively low. Over a period of time, the firm may be able to increase its productive capacity (through investment and training for example) and attract new labour (they could offer higher wages to encourage workers to leave an alternative supplier). The government may also help to address the underlying causes of these capacity constraints by expanding immigrant targets and allocating more of the budget to training those who are structurally unemployed. These approaches to expanding supply will be discussed in future chapters.



This factor also highlights why the PES will tend to change over time. As the firm gets closer to productive capacity, the PES will tend to decrease. For example, if there was an increase in the demand for movie tickets due to an excessively hot summer (too hot to go outside), initially firms may face a relatively high PES. This is because cinemas may be able to respond to the higher demand by opening the cinema for longer and filling more of the seats that had been empty in the past. However, eventually the cinema would reach its productive capacity, at which point its PES would drop significantly. If the cinema owners believed that unpredictable weather conditions would continue (due to climate change) and that they could maintain the high prices for cinema tickets they may add to their productive capacity permanently, by investing in new cinemas. This would then raise the PES for these services.

Durability of goods

If the goods can be stored, then it will be much easier to respond to changing prices. The supplier can simply access the **inventory** that has been stored. Storage is, however, often costly for firms and they may want to reduce the stock that they hold at a given time. Advances in technology have also helped firms as they can now employ 'Just In Time' (JIT) inventory management systems. By having closer connections with their suppliers using digital technologies, firms are more easily able to respond to increasing prices that are caused by increases in demand.

Many fresh food products tend to have a low price elasticity of supply as they have a limited storage life. Processed food products, however, such as soft drinks and baked beans, may be stored for extended periods and will therefore tend to have a higher PES. If there was a sudden increase in demand which resulted in higher prices of, for example, baked beans, the supplier could simply access any inventory that is available and reap the rewards. It is important to note, however, that once all of the stock is sold into the market, the firm then faces the same factors of PES that can make it difficult to increase supply (i.e. the production period and degree of spare capacity in the canning factory will affect the PES). The beans would need to be manufactured from scratch again so this could slow down the supply response and reduce the PES.

Activity 2k: Determining elasticities

For each of the following products discuss whether the price elasticity of demand and the price elasticity of supply are high or low:

1. Dishwashing liquid
2. Peaches
3. Spotify streaming services
4. Uber services on New Year's eve
5. Samsung phones
6. Education services at your school
7. Travel agent services
8. Beer
9. Small SUV vehicles
10. Organic Denim Jeans



Review questions 2.6

1. Define what is meant by price elasticity of demand and explain how PED affects the slope of the demand curve.
2. With reference to two relevant factors, explain why the PED for airline travel would be higher than the PED for cigarettes.
3. With reference to the concept of brand loyalty, explain why advertising expenditure may cause the demand curve for a specific product to shift to the right and become steeper.
4. Explain how knowledge of PED may affect the government's decision to place taxes on certain goods and services.
5. With reference to one or more specific product, explain why the PED will tend to increase over time.
6. Use a suitably labelled supply and demand diagram to explain why farmers, whose products tend to have low PED and low PES, face huge variations in their incomes.
7. Define what is meant by price elasticity of supply. Explain how PES affects the slope of the supply curve.
8. With reference to two relevant factors explain why the PES for bicycles may be higher than the PES for fresh avocados.
9. Explain how the increasing use of artificial preservatives has affected the PES of food products.
10. With reference to one or more specific product explain why the PES will tend to increase over time.
11. Evaluate the following statement 'a business would prefer to sell items with a high PED and a low PES'.

Multiple choice review questions

1. **The demand curve for most products is downward sloping because:**
 - a) at higher prices, some consumers may not be able to afford the good or service
 - b) at higher prices, substitute products become less appealing
 - c) consumers get greater benefits from subsequent consumption of a product
 - d) products lose their status appeal as their price decreases.
2. **The demand curve for new cars is likely to shift to the left if:**
 - a) There is an increase in the price of new cars
 - b) The government places a new tax on the suppliers of new cars
 - c) The government increases the taxes imposed on household income
 - d) The car companies increase their spending on advertising
3. **The demand for solar panels is likely to increase if:**
 - a) The price of solar panels increases
 - b) Increasingly erratic weather patterns result in rising temperatures
 - c) The government subsidises the coal mining industry
 - d) Most solar panels are imported and the Australian dollar depreciates
4. **The supply curve for black puffy, down-filled jackets is likely to shift to the right if:**
 - a) The manufacturers are faced with increased occupational health and safety requirements
 - b) There is a shortage of ducks in the world
 - c) Factories install solar panels
 - d) There is an increase in interest rates
5. **There will be a movement along the supply curve for coloured pencils to the left (contraction) if:**
 - a) More students choose to study art at schools
 - b) The price of wood increases
 - c) More illustrations are produced using an application like Adobe Photoshop.
 - d) The price of pencils decreases
6. **A cyclone, wiping out 90% of the banana crops in Australia will result in:**
 - a) A shift of the demand curve to the right and an increase in the price of bananas
 - b) A shift of the demand curve to the left and a decrease in the price of bananas
 - c) A shift of the supply curve to the right and a decrease in the price of bananas
 - d) A shift of the supply curve to the left and an increase in the price of bananas

- 7. An example of an inferior good is:**
- a) A new Star Wars toy
 - b) Kombucha
 - c) Bus travel
 - d) Manicure services
- 8. A movement along the demand curve for peanut butter might be caused by:**
- a) A drought
 - b) A ban on all nut products in all schools across Australia
 - c) A health report that highlights that nut products made in Australia might contain mould
 - d) A cure is found for nut allergies
- 9. An increase in the price of oil is likely to result in:**
- a) A decrease in the supply of new vehicles
 - b) A decrease in the demand for new bicycles
 - c) A decrease in price of electric vehicles
 - d) A decrease in exploration activities to find new sources of oil
- 10. What would happen in the market for Pink Lady apples if there was an increase in the price of Fuji apples?**
- a) The demand curve would shift to the right and the price would fall
 - b) The demand curve would shift to the right and the price would increase
 - c) The demand curve would shift to the left and the price would increase
 - d) The demand curve would shift to the left and the price would fall
- 11. If average wage growth in Australia increases to 4% (the current rate is approximately 2%), then in the market for new computers**
- a) the price would increase, and the quantity traded would fall
 - b) the price would increase, and the quantity traded might increase or fall
 - c) neither the price or quantity change can be determined
 - d) both the price and quantity traded would increase
- 12. If the price for soft drinks increases by 10% and this results in a fall in the quantity demanded for soft drinks by 5% then the product**
- a) Has a low PED
 - b) Has a high PED
 - c) Has a low PES
 - d) Has a high PES
- 13. Which of the following products is likely to have a PED that is higher than its PES?**
- a) Streaming services such as Netflix
 - b) Apple iPads
 - c) Cans of Coca Cola
 - d) Paintings by Andy Warhol (deceased)
- 14. The PED for Cadbury chocolate might fall if:**
- a) a new competitor enters the market
 - b) the price of cacao (an essential ingredient) doubles
 - c) there is a news report that highlights how the polyphenols in chocolate reduce the ageing process
 - d) the government introduces a sugar tax
- 15. An increase in the price of water could result in:**
- a) more resources being allocated to the production of water tanks
 - b) an increase in the price of coca cola
 - c) a contraction along the demand curve for food
 - d) all of the above

16. **Consider a business that operates in a market where its main competitor has just closed down due to bankruptcy. To maximise its profits the business should:**
- a) increase its prices
 - b) decreases its prices
 - c) keep the price at its current level
 - d) reduce supply
17. **A change in the way music is consumed such that people rely more heavily on streaming services than the purchase of physical copies of music may have resulted in:**
- a) a decrease in the demand for Bluetooth headphones
 - b) an increase in the incomes received by musicians
 - c) a decrease in the price of Compact Discs
 - d) more resources being allocated to labour in retail outlets such as JB Hi Fi (who sell physical copies of music)
18. **There will be an increase in the quantity of resources allocated towards housing if:**
- a) immigration targets are increased by 10%
 - b) the cost of materials increases
 - c) there is a recession that causes an increase in unemployment
 - d) people choose to live at home with their parents for longer
19. **The PES for canteen food is unlikely to be affected by:**
- a) The availability of staff on a particular day
 - b) The size of the ovens
 - c) The space available to store the food
 - d) The arrival of a McDonalds across the road from the school
20. **Living standards in a more competitive market may decline if:**
- a) the price paid by the consumer falls
 - b) a greater variety of goods and services is provided
 - c) less resources are wasted due to increased efficiency
 - d) greater pressure is placed on employees to meet production targets

Chapter 2 Extended economic exercise on the housing market

Using demand and supply theory to analyse changes in the housing market

Now that you have completed a full chapter on demand and supply analysis it is a good idea to look at a comprehensive case study about how a market can change dramatically over the course of a year or two. One such market is the housing market, which receives an enormous amount of media attention because it has such a significant impact on living standards.

Each year Demographia (a housing affordability think tank), reports on the affordability of housing in a number of major cities from around the world. The 2018 report indicated that Australia was rated as 'severely unaffordable', a situation where house prices are more than 5 times the median income. Sydney was considered the least affordable city in the country, with a median house price to income ratio of nearly 13.

The lack of affordability in Australian housing has been driven by very rapid increases in house prices when compared to the significantly lower increase in median incomes. Demographia suggests that the lack of affordability has been driven by the significant increases in land prices as well as by investment activity which is speculative in nature (people buy property in the hope that they can sell it for a higher price in the future). Most governments in Australia have restrictive land use regulations in place that limit urban sprawl and make it difficult to gain planning permission for more densely populated developments in the inner city. When this is combined with rapid increases in population growth (Australia's immigration targets are some of the highest on a per capita basis in the industrialised world), then the relative shortage of available property puts upward pressure on prices. Record low interest rates and the ease with which the average Australian could borrow also placed upward pressure on prices.



The upward trend in house prices did, however, start to reverse in 2017/18 with Sydney prices falling by the largest percentage. For example, Sydney average house prices fell by 7.1% for the year ended August 2018, while in Melbourne house prices fell by 2.7%. As economics students, it is a good idea to brainstorm the factors that might have contributed to the fall in house prices, so you may wish to pause here before reading the next section of this case study.

Some of the factors that may have contributed to the falling house prices are outlined below (with more falls predicted for the coming years).

The implications from the Financial Services Royal Commission

In 2018, Malcolm Turnbull (who was at the time Australia's Prime Minister) called for a banking Royal Commission. One of the findings from this investigation was that banks had based many of their lending decisions on flawed information. Some of the loans offered were referred to as 'liar loans' and the recipients were lent more than they were capable of paying back. Following these revelations, banks responded by undertaking more thorough due diligence by asking their potential borrowers to provide evidence of their spending patterns. This actually made it more difficult for people to obtain loans of the size they wanted. This meant that when they went to buy a property (at auction or private sale), they had less funds to bid up the price of the property.

Interest rates

In 2018, three out of the four major banks, as well as a large number of smaller lenders, raised their home loan interest rates (most home loan products in Australia have variable interest rates). For example, even though the cash rate (the interest rate on the overnight money market that is set by the RBA) remained unchanged at 1.5%, the Commonwealth Bank increased their home loan rates by 15 basis points. This increased cost of borrowing meant that it was more difficult to service loans, and this resulted in further decreases in the ability to borrow for housing.

Very high levels of existing debt

Some economic commentators describe Australia's debt situation as 'peak debt'. Some of those borrowers also took out 'interest only' loans at the beginning, such that they did not pay off any of the principal (amount borrowed) in the early years of their loans. In 2018/19 many loans converted from interest only to interest plus principal, which meant that a greater amount of discretionary income was needed to meet the terms of the loan contract. Given the very high levels of existing debt and the ageing of the Australian population, it is not surprising that households looked to 'repair their balance sheets' by reducing their level of debt. This meant that many households may have been reluctant to increase the size of their loan and the speculative element of investing in property for capital gains looked less promising.

Possible government policy changes

As part of his unofficial election campaign, the Labor Leader Bill Shorten, made a commitment to reduce the scope of negative gearing for those investing in property. He also said he would reduce the tax concession on capital gains for those who made profits on the buying and selling of property. Negative gearing refers to the process whereby owners of investment properties can deduct their losses from that investment against their regular income. This has the effect of distorting the price mechanism because the owner does not pay for the full cost of owning and renting out the property (part of the cost is passed onto taxpayers). The Labor proposal (which may have been implemented by the time you read this), would involve removing the ability of owners to deduct losses from 'second-hand' properties. Even though the policy was not in place in 2018, it was still having a negative effect on demand because investors worried that future investors might not want to pay such high prices if they could no longer deduct losses and that they themselves could be faced with higher capital gains tax liabilities if and when they sold their property.

Application questions

1. With reference to the law of demand, explain why an increase in the price of houses would be associated with a contraction in demand.
2. Explain why it was difficult for property developers to respond to the increase in demand and how this influenced the change in the equilibrium price leading up to 2016/17.
3. Identify two demand factors that may have contributed to the rapid increase in house prices in the two years up to 2016/17.
4. Construct a suitably labelled demand and supply diagram for houses in the suburb in which you live. Use the internet to research the change in median house prices. Compare the median house price today with what it was 7 years ago and what it was 2 years ago.
5. There are four demand factors that are identified as causing the downward trend in house prices in the year ended 2017/18. Explain how two of these factors may have resulted in behavioural change. Then explain how this caused disequilibrium in the market and resulted in changes to the equilibrium price and quantity traded.
6. In 2018, the auction clearance rate in Melbourne (the percentage of houses sold at auction on a particular

Saturday) fell to approximately 55% (compared to 70% the year before). Explain how this result might be linked to falling property prices.

7. Evaluate how the fall in property prices might impact upon living standards in Australia.
 8. Explain why the price elasticity of demand for housing might have increased in recent times (despite the fall in prices).
 9. Explain how the fall in property prices might affect the willingness of developers to supply, as well as the PES.
- Extension task:** Collect information over the course of the year on property prices (the AFR has a property section which is very useful), and keep a summary of each of the demand and supply factors that are mentioned. Each time a new factor is discovered, construct a demand and supply diagram to show how the market outcomes change.

Chapter summary

1. Microeconomics is the study of the individual parts of the economy that interact to make up the whole economy.
2. A market is anywhere that facilitates the exchange of goods and services. Buyers and sellers may exchange goods in person or via online facilities.
3. A competitive market is one where all economic agents are price takers. No individual buyer or seller has the market power to influence prices. It is easy for new competitors to enter these markets as set up costs are low and the government does not restrict entrants.
4. Consumers will try to obtain the product at the lowest price possible while the seller will try to extract the highest price possible. Analysis of demand and supply predicts the likely compromise between the two parties.
5. The law of demand states that as the price of a product increases the quantity demanded will tend to decrease. Conversely if the price of the product decreases, the quantity demanded will tend to increase.
6. The law of demand is logical because at higher prices a consumer's ability and willingness to purchase tends to decrease and because the consumption of most goods is subject to the law of diminishing marginal utility.
7. The effect on demand of an increase in price is represented by a movement along the demand curve to the left (called a contraction). The effect on demand of a decrease in price is represented by a movement along the demand curve to the right (called an expansion).
8. When the demand curve is drawn with price on the vertical axis and quantity on the horizontal axis, all other factors that affect the demand for the product are assumed to be held constant. A change in any of these factors will result in a shift of the demand curve to the left or right.
9. A shift of the demand curve to the right means that more is being demanded at each given price. A shift to the left of the demand curve means that less is being demanded at each given price.
10. An increase in disposable income will generally lead to a shift of the demand curve to the right for normal goods and a shift to the left for inferior goods.
11. A decrease in interest rates will increase discretionary income for indebted households and businesses and usually result in an increase in demand for most goods and services. Changes in the prices of other essential items such as petrol will also affect the discretionary income of households and may affect the demand for other seemingly unrelated products.
12. If the price of a substitute good or service increases there will be an increase in demand for the alternative product (resulting in a shift to the right of the demand curve).
13. A complementary good or service is one that is consumed together with another. An increase in the price of a complementary good or service will mean that the cost of consuming both has increased resulting in a decrease in demand for the complementary good (even if its price has not increased).
14. An increase in population will generally result in an increase in the demand for most goods and services.
15. An improvement in consumer sentiment (confidence), which measures consumers' general expectations about future economic prosperity, will generally lead to an increase in discretionary spending and result in an increase in the demand for a broad range of goods and services.
16. If a product becomes fashionable, this is likely to result in an increase in demand. This is described as a change in tastes and preferences.
17. The law of supply states that as the price increases for a good or service there will generally be an increase in the quantity supplied.
18. The law of supply is logical because at higher prices suppliers have more incentive to shift resources into those areas which will generate greater profits.
19. An increase in the price of a product will result in a shift along the supply curve to the right (an expansion). A decrease in the price of a product will result in a shift along the supply curve to the left (a contraction).
20. When the supply curve is drawn with price on the vertical axis and quantity on the horizontal axis, all other factors affecting supply are assumed to be held constant. A change in any of these factors will result in a shift of the supply curve to the left or right.
21. If the supply curve shifts to the right, there will be a greater volume supplied to the market at each given price. A shift of the supply curve to the left means that less will be supplied at each given price.

22. An increase in the cost of any inputs associated with making a product will result in a shift of the supply curve to the left. Common costs of production include wages, utility costs and rent.
23. New technology may reduce the cost per unit and will tend to shift the supply curve to the right. This is usually due to the boost that technology provides to productivity.
24. Supply for any good or service that depends upon favourable climatic conditions will shift to the left if changes in the climate restrict the production of the raw ingredients used to make these goods and services. Human activity can also cause disruptions to supply (such as wars).
25. The market equilibrium is a situation where the demand for a good or service is equal to the supply of a good or service.
26. A shortage develops when the price is below the equilibrium price and the demand is greater than the supply for the product.
27. A surplus develops when the price is above the equilibrium price and the demand is less than the supply for the product.
28. A movement of the demand and/or supply curve will result in a new equilibrium price and quantity traded.
29. The relative price is seen as the price of any one good or service measured in terms of the price of another good or service.
30. Relative prices send clear signals to producers and consumers and therefore direct resources to their highest end use.
31. Prices help to answer the three economic questions; what to produce, how to produce and for whom to produce. They therefore determine how resources are allocated in the economy.
32. The price mechanism describes how the forces of demand and supply determine relative prices of goods and services, which then ultimately determines the way our productive resources (e.g. labour and capital) are allocated in the economy.
33. The price mechanism generally results in an efficient allocation of resources meaning that households' living standards are increased. The right types are provided in the market and these are offered at the lowest possible price.
34. The price mechanism may have a negative impact on living standards if it makes workers and business owners more stressed.
35. Price elasticity of demand refers to the responsiveness of demand to changes in prices and is measured by the percentage change in quantity demanded divided by the percentage change in price.
36. A low price elasticity of demand means that the percentage change in quantity demanded is less than the percentage change in price. A high price elasticity of demand means that the percentage change in quantity demanded is higher than the percentage change in prices.
37. PED is an important economic measure because it helps businesses to analyse the impact of price changes on revenues and allows the government to consider which goods are the most appropriate to impose an indirect tax upon.
38. Price elasticity of demand will tend to increase if there are a number of viable options available for the consumer as small price increases result in a substitution towards these alternative products.
39. Price elasticity of demand will tend to decrease if the good or service is deemed to be a necessity or is highly addictive.
40. Price elasticity of demand will tend to increase if the purchase of the product consumes a large portion of a purchaser's income.
41. Generally speaking the PED will increase over time because consumers will have more time to consider alternatives and to adjust their behaviour in response to the price change.
42. Price elasticity of supply measures the responsiveness of quantity supplied to changes in price.
43. A low price elasticity of supply means that the percentage change in quantity supplied is less than the percentage change in price. A high price elasticity of supply means that the percentage change in supply is more than the percentage change in price.
44. Price elasticity of supply is an important economic measure because it helps businesses to determine the impact of price changes on their profitability and it may also determine how vulnerable a country is to changes in the prices of the goods and services it exports.
45. Price elasticity of supply will tend to increase if the product can be stored easily.
46. Price elasticity of supply will tend to increase if firms are operating with some spare capacity and can ramp up production quickly.
47. Price elasticity of supply will tend to be lower in the short term but as resources are re-allocated across the economy to more profitable areas, price elasticity of supply will tend to increase.