

CHAPTER 4

MICROECONOMICS

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LEARNING OUTCOMES

After completing this chapter, you should be able to do the following:

- a** Define economics;
- b** Define microeconomics and macroeconomics;
- c** Describe factors that affect quantity demanded;
- d** Describe how demand for a product or service is affected by substitute and complementary products and services;
- e** Describe factors that affect quantity supplied;
- f** Describe market equilibrium;
- g** Describe and interpret price and income elasticities of demand and their effects on quantity and revenue;
- h** Distinguish between accounting profit and economic profit;
- i** Describe production levels and costs, including fixed and variable costs, and describe the effect of fixed costs on profitability;
- j** Identify factors that affect pricing;
- k** Compare types of market environment: perfect competition, pure monopoly, monopolistic competition, and oligopoly.

INTRODUCTION

1

Would you prefer to buy a new car, to have more leisure time, or to be able to retire early? Can you afford to do all three? If not, you will need to prioritise.

Prioritising is what individuals and organisations do all the time, and it involves trade-offs. An individual only has so many hours in a week and so much money. A city may want to build new schools, better recreation facilities, and a bigger industrial park. If it decides to build new schools, it may have to cut back spending on recreation or industrial facilities. Alternatively, the city could try to increase its share of resources by increasing taxes or borrowing money.

Individuals and organisations have numerous wants and must prioritise them. In The Investment Industry: A Top-Down View chapter, we learned that resources to meet these wants are often limited or scarce—such resources as labour, real assets, financial capital, and so on are not unlimited. Thus, individuals and organisations have to make decisions regarding the allocation of these scarce resources.

Economics is the study of production, distribution, and consumption or the study of choices in the presence of scarce resources, and it is divided into two broad areas: microeconomics and macroeconomics. **Microeconomics** is the study of how individuals and companies make decisions to allocate scarce resources, which helps in understanding how individuals and companies prioritise their wants. **Macroeconomics** is the study of an economy as a whole. For example, macroeconomics examines factors that affect a country's economic growth. Macroeconomics is discussed further in the next chapter.

This chapter focuses on factors that influence the supply and demand of products and services. Many of the explanations and examples focus on products, but they are equally applicable to services. **Supply** refers to the quantity of a product or service sellers are willing to sell, whereas **demand** refers to the quantity of a product or service buyers desire to buy. The interaction of supply and demand is a driving force behind the economy and is part of the “invisible hand”¹ that, over time, should lead to greater prosperity for individuals, companies, and society at large.

Understanding microeconomics is useful to companies when considering such issues as how much to charge for their products and services and what reaction they may see from competitors. Microeconomics helps investment analysts assess the profitability of a company under different scenarios. For example, the analyst may want to determine whether a company has the ability to increase revenues by cutting the prices of its products and increasing the quantity sold. To do so, the analyst will have to consider demand for the company's products and the degree of competition in the company's market environment.

¹ A term from Adam Smith's 1776 book, *An Inquiry into the Nature and Causes of the Wealth of Nations*, in which the invisible hand refers to the role of the markets in allocating scarce resources.

Similarly, microeconomic concepts help investors allocate their savings. Investors try to provide capital to companies that will make the most efficient use of it. As noted in The Investment Industry: A Top-Down View chapter, efficient allocation of capital benefits investors and the economy as a whole. Knowing how microeconomics affects a company's revenues, costs, and profit is vital to understanding the health of a company and its value as an investment.

2

DEMAND AND SUPPLY

Buyers demand a product, and sellers supply the product. Consumers buy products, such as cars, books, and furniture, from manufacturers and retailers, who sell them in markets. These markets can take the form of physical structures, such as supermarkets or shops, or they can be virtual, internet-based markets, such as eBay or Amazon. Properly functioning markets are essential to capitalism because the interaction of buyers and sellers determines the price and quantity of a product or service traded.

The organisation of markets is important in microeconomics. In some markets, there is a single provider of a product or service, whereas in other markets, there are many companies providing the same or similar products or services. For example, there may be only one regional power company supplying electricity, but there may be many companies providing home insurance. How markets are organised can affect how the companies operating in these markets set prices and is discussed further in Sections 5 and 6.

We will start by defining demand and discussing factors that affect the demand for products and services. Then we will discuss factors that affect the supply of products and services. We will also describe how the interaction of supply and demand determines the equilibrium price, which is the price at which the quantity demanded equals the quantity supplied.

2.1 Demand

When economists refer to demand, they mean the desire for a product or service coupled with the ability and willingness to pay a given price for it. Consumers will demand and pay for a product as long as the perceived benefit is greater than its cost or price.

2.1.1 The Law of Demand

It is logical that if the price of a product goes up, consumers will normally buy less of the product. For instance, if the price of fuel rises, car owners will use their cars less and so buy less fuel. Quantity demanded and price of a product are usually inversely related, which is known as the **law of demand**.

At the beginning of the chapter, we indicated that individuals satisfy wants through the choices they make regarding scarce resources. Economists term this satisfaction of want as **utility**; utility is a measure of relative satisfaction. For example, consumers derive utility or satisfaction from eating pizza. According to the **law of diminishing**

marginal utility, the marginal (additional) satisfaction derived from an additional unit of a product decreases as more of the product is consumed. For example, the satisfaction a consumer gets from eating each additional slice of pizza diminishes as the total amount eaten increases. As demonstrated in Exhibit 1, a consumer may enjoy eating one slice of pizza when his or her stomach is empty, but as the consumer's stomach fills, eating a second slice of pizza typically brings less satisfaction.

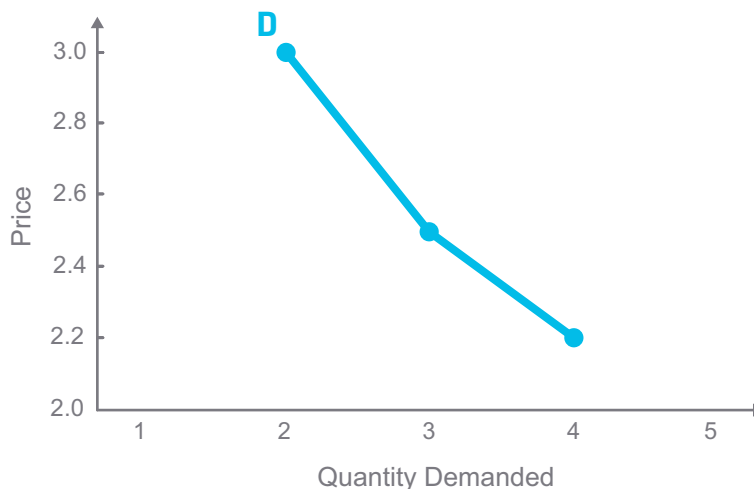
Exhibit 1 Diminishing Marginal Utility



2.1.2 The Demand Curve

The law of demand can be represented on a graph, with quantity demanded on the horizontal axis and price of the product on the vertical axis. The curve that shows the quantity demanded at different prices is the **demand curve**. Exhibit 2 shows a consumer's hypothetical demand curve for pizza.²

² For simplicity, we assume in this exhibit and the following discussion that the demand curve is based on an individual's demand. In reality, the demand curve reflects what economists call aggregate demand—that is, the sum of all the individuals' demands.

Exhibit 2 Hypothetical Demand Curve for Pizza

The demand curve in Exhibit 2 shows the quantities of pizza that the individual is willing to buy at various prices over a given period, if all other factors affecting demand remain constant. Note that the demand curve slopes downward from left to right, indicating that as the price of pizza decreases, the quantity the individual is willing to buy increases. Factors affecting supply, such as input costs, do not affect the demand curve at all.

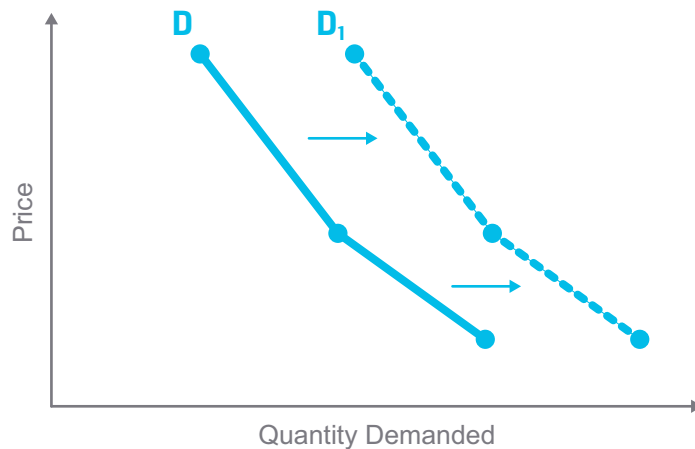
If the price of pizza changes, there is a change in the quantity demanded, which is represented by a move along the demand curve. So, as shown in Exhibit 2, at a price of 3.0 the individual demands two slices of pizza. But for three slices of pizza, the individual is only willing to pay the lower price of 2.5. Effectively, the individual is only willing to pay an additional 1.50 $[= (3 \times 2.5) - (2 \times 3.0)]$ for the third slice.

Note that when the only thing that changes is the price, the quantity demanded changes, but the demand curve itself does not change—that is, a change in the price of a product leads to a move *along* the demand curve, not a *shift* in the demand curve. However, if one or more other factors that affect demand change, the overall level of demand for the product at any given price may change. If so, the demand curve itself shifts. The demand curve in Exhibit 2 may shift if the individual's income changes, if the prices of other food or non-food products change, or if the individual stops liking pizza as much.

A change in a factor may make the product more attractive—for instance, if the price of sandwiches, a substitute for pizza, increases relative to the price of pizza. In this case, demand will shift to the right, meaning that people will demand more of the product at a given price. The range of prices of the product has not changed, but the quantity demanded at each price has increased. Alternatively, a change in a factor may make the product less attractive—for instance, if people's tastes change and they stop liking pizza as much. In this case, demand will shift to the left, meaning that people will demand less of the product at a given price. The range of prices for the product has not changed, but the quantity demanded at each price has decreased.

Exhibit 3 illustrates how a change in a factor that has made the product more attractive shifts the demand curve to the right from D to D_1 .

Exhibit 3 Shift in the Demand Curve to the Right



Now we will take a closer look at the major factors that affect the demand curve.

2.1.3 Effect of Income on Demand

A change in demand for a product resulting from a change in purchasing power is called the **income effect**.

A change in a consumer's income may shift a product's demand curve. For most goods—called **normal goods**—if income increases, demand increases too. Meat is an example of a normal good in most emerging economies. For **inferior goods**, the relationship works in the opposite direction. That is, demand for inferior goods decreases as income increases. Grain is often considered an inferior good. So, when incomes are higher, people consume more meat relative to grain.

Recessions offer an example of when demand for inferior products increases. During a period of decline in economic activity, consumers tend to switch to lower-cost brands and shop more at discount stores than at department stores. So, during recessions, investors may focus on companies that sell inferior goods to identify stocks that may perform better.

2.1.4 Effect of the Expected Future Price of a Product on Demand

There is a positive relationship between the expected future price of a product and its current demand—that is, both the expected future price and current demand move in the same direction. For example, if consumers expect that the price of rice will increase as a result of a shortage, the current quantity of rice demanded may increase as consumers accumulate it to avoid paying a higher price in the future. The quantity demanded at all prices will rise in anticipation of the price increase, leading to a shift

in the demand curve to the right. In contrast, if the price of a product is expected to fall in the future, current demand may go down as consumers wait for the price to decrease before purchasing.

2.1.5 Effect of Changes in General Tastes and Preferences on Demand

Changes in consumers' general tastes and preferences may also affect a product's demand curve. For example, if a report that links eating chocolate to better health is published, demand for chocolate bars may increase. In that case, the demand curve for chocolate will shift to the right. Investors and analysts often consider demographic trends and shifts in consumers' tastes and preferences when evaluating an investment.

2.1.6 Effect of Prices of Other Products on Demand

As we saw earlier, if the price of sandwiches increases, people may eat more pizza instead. The effect of a change in the prices of other products on a product's demand curve depends on the type of relationship between the products.

2.1.6.1 Substitute Products A **substitute product** or **substitute** is a product that could generally take the place of (substitute for) another product. For many consumers, Coke and Pepsi are considered fairly close substitutes.

Consumers substitute relatively cheaper products for relatively more expensive ones. So, if the price of a substitute product decreases, demand for the substitute may increase and demand for the original product may decrease. Example 1 describes this effect using Coke and Pepsi.

EXAMPLE 1. EFFECT OF A CHANGE IN COKE'S PRICE ON THE DEMAND FOR COKE AND PEPSI

If the price of Coke decreases, there is likely to be an increase in demand for Coke and a decrease in demand for Pepsi. If a bottle of Coke and Pepsi each sell for \$1, people will have no preference based on price. But if the Coca-Cola Company decides to try to increase its market share, it might cut—perhaps just temporarily—the price of a bottle of Coke to 90 cents. Although there will still be many loyal Pepsi consumers, there will probably be a number of people who will buy Coke instead of Pepsi because it is now cheaper. Coca-Cola hopes that some of these people then develop a preference for Coke over Pepsi and become loyal Coke drinkers. So, if Coca-Cola subsequently returns its price to \$1, it hopes that it has a larger loyal customer base that will choose Coke over Pepsi.

2.1.6.2 Complementary Products **Complementary products** or **complements** are products that are frequently consumed together. When the price of a product decreases, it leads to an increase in demand for both the product and for its complementary products. For example, printing paper and ink cartridges are complementary products. If the price of ink cartridges decreases, consumers may print more and purchase both more ink cartridges and printing paper.

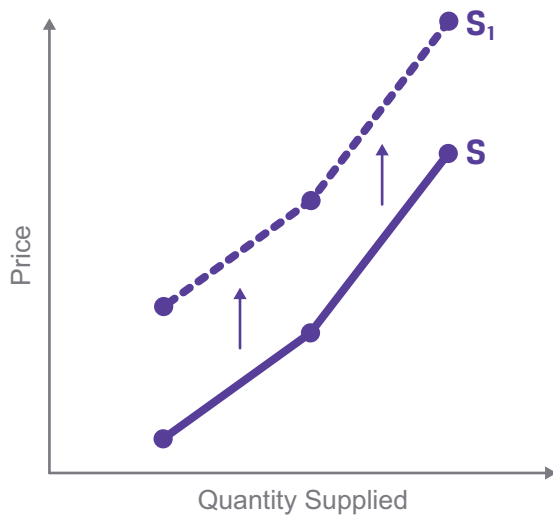
2.1.6.3 Unrelated Products Demand for a particular product may be affected by prices of other products that are not substitute or complementary products. For example, a substantial increase in oil prices often causes demand for unrelated products, including pizzas, to decrease. The reason is because many people use cars to go to work, school, or shopping and will have to pay more to put fuel in their cars if the price of oil rises. As a result, they will have less money to buy other products.

Psychology is often involved in a consumer's decision-making process, which makes it difficult to quantify exactly the effect of a change in other products' prices on the demand for a particular product. For example, because people often buy oil-related products, they closely watch price changes in oil and may overall consume less if oil prices increase. Yet, an increase in the price of cars—which is a much more expensive product that will have a greater effect on the household budget—may not lead to a reduction in demand. The reason is because consumers tend to pay less attention to price changes of products that are purchased infrequently. Evaluating these types of psychological factors helps investors understand whether, for instance, a pizza company may see a decrease in sales when oil prices increase.

2.2 Supply

The **supply curve** represents the quantity supplied at different prices. The **law of supply** states that when the price of a product increases, the quantity supplied increases too. Thus, the supply curve is upward sloping from left to right. The law of supply and the supply curve are illustrated in Exhibit 4. S and S_1 are supply curves.

Exhibit 4 Supply Curve



The principles that apply to the demand curve also apply to the supply curve. A change in the price of a product leads to a move *along* the supply curve, not a *shift* in the supply curve.

Factors other than the product's price that may lead to a shift in the supply curve include production costs, technology, and taxes. Higher production costs and taxes will result in reduced supply at each price and shift the supply curve to the left, meaning that the supplier is willing to offer the same quantity at higher prices or a smaller quantity at the same prices. This is shown in the move from S to S_1 in Exhibit 4.

Lower production costs, which may be the result of improvements in technology, lower costs of inputs such as raw materials or labour, or lower taxes, will result in increased supply for a given price. The supply curve will shift to the right.

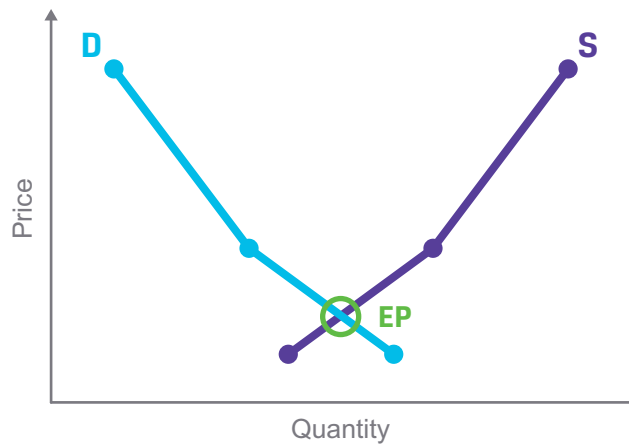
Changes in the supply curve are of considerable interest to investors and analysts. A shift in the supply curve caused by higher or lower costs can affect the profits generated by a company. For example, a car manufacturer that faces higher steel prices may be willing to produce fewer cars at a given price level, which changes the supply curve. Whether a company can pass on any cost increases to customers helps investors assess the company's future profits.

A company that cannot cover its costs and earn a profit at prices along certain parts of the supply curve will not supply products at those prices. Companies may view factors affecting the supply curve as temporary and be willing to continue operations despite short-term losses. But if the mismatch between revenues and costs persists for longer periods, it can cause companies to file for bankruptcy or shut down. Many airlines have encountered this problem when their production costs, such as the cost of fuel, increased. Their ability to increase fares was limited because customers may have chosen an alternative airline or mode of travel. Equally, they could not easily add or reduce the number of seats on their planes. So, some airlines accumulated large losses and were forced to declare bankruptcy.

2.3 Market Equilibrium

To determine how prices are set in a world of supply and demand, it is important to understand the concept of economic equilibrium. **Market equilibrium** occurs at the price where quantity demanded equals quantity supplied. At the equilibrium price, demand and supply in the market are balanced, and neither buyers nor sellers have an incentive to try to change the price, all other factors remaining unchanged.

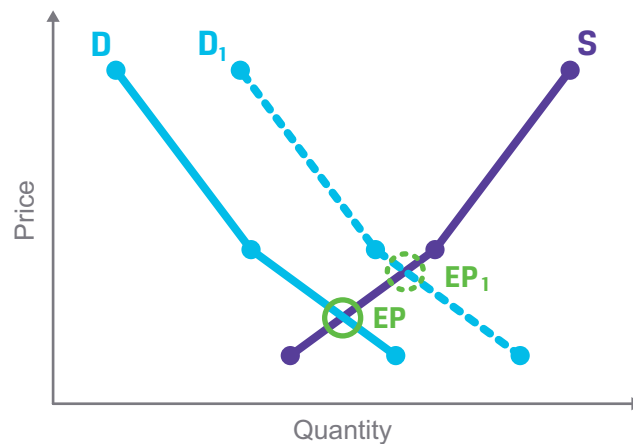
As illustrated in Exhibit 5, the interaction between the demand and supply curves determines the equilibrium price of a product. The **equilibrium price** (EP) is the price at which the quantity demanded (D) equals the quantity supplied (S). In other words, it is the point at which the demand and supply curves intersect.

Exhibit 5 Interaction of Demand and Supply Curves

At any price above the equilibrium price (EP) in Exhibit 5, suppliers are willing to produce more of a product than consumers are willing to buy. A price that is higher than the equilibrium price may result in increasing inventories, which provides an incentive for suppliers to cut prices to reduce their inventories. Prices will thus move back toward the equilibrium price. Conversely, if the price is below the equilibrium price, consumers will demand more of a product than suppliers find it profitable to produce. To meet consumers' higher demand, suppliers' inventories may be depleted. Once inventories are depleted, suppliers have an incentive to raise prices and increase production. Prices will thus move back toward the equilibrium price. The only price at which suppliers and consumers are both content, with no imbalance between the quantity produced and the quantity demanded, is at the equilibrium price.

What factors—other than the price of the product—affect the market equilibrium price? If demand increases because of an increase in consumers' income, and the supply curve stays the same, the result is an increase in the equilibrium price and quantity, which is shown in Exhibit 6. A shift in the demand curve to the right, from D to D_1 , could also be the result of an increase in the price of a close substitute, a decrease in the price of a close complement, or an advertising campaign that successfully changes consumers' tastes and preferences.

Exhibit 6 Shift in the Demand Curve to the Right with the Supply Curve Unchanged



The supply curve can shift while the demand curve remains unchanged. An increase in taxes could lead to a shift in the supply curve to the left, as could any increase in production costs, such as wages or energy costs. A decrease in these costs would have the opposite effect and shift the supply curve to the right, leading to increased production at each price. For example, if the government decreases the taxes companies have to pay for their workers' salaries, companies may hire more people and increase production as a result. Companies' costs will be lower, so they will be willing to produce more of a given product at the current price. This strategy was used in India and Ireland after the global financial crisis that started in 2008. The Indian and Irish governments cut taxes in an effort to stimulate their economies, resulting in companies increasing output (quantity produced) and hiring workers because the costs of doing so were lower.

So, looking at the supply and demand curves is useful when analysing factors driving company, industry, and consumer behaviour.

3

ELASTICITIES OF DEMAND

Although supply and demand curves are essential to an understanding of price and quantity changes, they are less useful in assessing the magnitude of these changes. To gauge the change in quantities demanded by consumers and supplied by producers, we use elasticity measures.

In economics, **elasticity** refers to how the quantity demanded or supplied changes in response to small changes in a related factor, such as price, income, or the price of a substitute or complementary product. There are many important uses for elasticity for companies, investors, and the overall economy. For example, if the demand for certain products rises substantially as incomes increase, investors and analysts may be able

to identify the companies and industries that will grow the quickest as the economy grows. Elasticity of demand thus has relevance to anticipate which companies and industries will be successful in the future.

3.1 Price Elasticity of Demand

Price elasticity of demand allows for the comparison of the responsiveness of quantity demanded with changes in prices. Two widely used measures are own price elasticity of demand and cross-price elasticity of demand.

3.1.1 Own Price Elasticity of Demand

The **own price elasticity of demand** is the percentage change in the quantity demanded of a product as a result of the percentage price change in that product. It is calculated as the percentage change in the quantity demanded of a product divided by the percentage change in the price of that product. Because a proportional change in one variable is divided by a proportional change in another, the effect is to remove the unit of measure. So price elasticity is unit free, as are other elasticity concepts.

Examples of own price elasticity of demand are provided in Example 2.

EXAMPLE 2. OWN PRICE ELASTICITY OF DEMAND

The own price elasticity of demand for a product is

$$\frac{\text{Percent change in the quantity demanded of the product}}{\text{Percent change in the price of the product}}$$

If a 10% decrease in the price of cars leads to a 15% increase in the quantity demanded, then the own price elasticity of demand for cars is

$$\frac{+15\%}{-10\%} = -1.5.$$

If a 10% increase in the price of hotel rooms leads to a 20% decrease in the quantity demanded, then the own price elasticity of demand for hotel rooms is

$$\frac{-20\%}{+10\%} = -2.$$

When looking at elasticities, two elements matter: the sign and the magnitude.

The sign of price elasticity of demand provides information about how the quantity demanded changes relative to a change in price. As illustrated in Example 2, own price elasticity of demand is usually negative, reflecting the law of demand discussed in Section 2.1.1—that is, the inverse relationship between price and quantity demanded.

The magnitude of price elasticity of demand provides information about the strength of the relationship between quantity demanded and changes in price. When price elasticity is less than -1 , such as in the car and hotel room examples, the price elasticity of demand is high, or elastic. This means that a small change in price produces a

disproportionally larger change in demand. Conversely, if price elasticity is between -1 and 0 , the price elasticity is low, or inelastic. Changes in prices for inelastic products are accompanied by less than proportional changes in the quantity demanded, which means demand is not very price sensitive. If the price elasticity of demand is exactly -1 , it is said that demand is unit elastic. In this case, a percentage change in price is accompanied by a similar, but opposite, percentage change in the quantity demanded.

Products for which demand increases as price increases have positive own price elasticities. This result usually indicates that the product is a **luxury product**. For luxury products, such as expensive cars, watches, and jewellery, an increase in price may lead to an increase in quantity demanded.

Exhibit 7 summarises what the sign and magnitude of own price elasticity mean.

Exhibit 7 Sign and Magnitude of Own Price Elasticity

Sign and Magnitude	Description
Less than -1	Negatively, highly elastic: For a given percentage increase in price, the quantity demanded will decrease by a greater percentage than the increase in price.
-1	Negatively unit elastic: For a given percentage increase in price, the quantity demanded will decrease by the same percentage.
Greater than -1 to 0	Inelastic: For a given percentage increase in price, the quantity demanded will decrease by a lesser percentage than the increase in price.
Greater than 0 but less than 1	Inelastic: For a given percentage increase in price, the quantity demanded will increase by a lesser percentage than the increase in price.
$+1$	Positively unit elastic: For a given percentage increase in price, the quantity demanded will increase by the same percentage.
Greater than $+1$	Positively, highly elastic: For a given percentage increase in price, the quantity demanded will increase by a greater percentage than the increase in price.

The sign and magnitude of the own price elasticity helps a company set its pricing strategy. In setting prices, a company needs to know whether a small percentage increase in price will lead to a decrease in sales and if it does, whether it is a large or small percentage decrease in sales. Cutting the price of a product whose own price elasticity is less than -1 tends to lead to an increase in total revenue. Total revenue is usually measured as price times quantity of products sold. So, when elasticity is highly negative, the decrease in price is more than offset by a greater increase in quantity. By contrast, cutting the price of a product with inelastic demand leads to a decrease in total revenue because the percentage increase in quantity is less than the percentage decrease in price.

Uniform, non-differentiated products, such as fuel or flour, are typically products with highly negative own price elasticities of demand. Companies with many competitors selling similar products may find that increasing prices leads to a reduction in revenue.

Perfectly inelastic demand indicates that quantity demanded will not change at all, even in the face of large price increases or decreases. Perfectly inelastic demand may occur with products that have no substitutes and are necessities, such as drugs under patent. If the drug is beneficial and under patent protection, the manufacturer should be able to charge a higher price without losing sales. Once the patent expires and cheaper generic drugs become available, the manufacturer may have to lower its price to maintain sales.

Another example of a price inelastic product is one that has a well-defined identity, such as the Apple iPad. The reason is because, in the mind of many consumers, other tablets do not compare with the iPad; there are no perceived substitute products. As a result, the quantity sold may be insensitive to price increases and an increase in price of the iPad may lead to higher revenues for Apple.

3.1.2 Cross-Price Elasticity of Demand

Own price elasticity of demand shows the change in the quantity demanded of a product as a result of a price change in that product. But investors and analysts are also interested in the change in the quantity demanded of a product in response to a change in the price of another product. This is known as **cross-price elasticity of demand**. It is the percentage change in the quantity demanded of a product in response to a percentage change in the price of another product.

Examples of cross-price elasticity of demand are provided in Example 3.

EXAMPLE 3. COMPLEMENTARY PRODUCTS

The cross-price elasticity of demand for a product is

$$\frac{\text{Percent change in the quantity demanded of Product 1}}{\text{Percent change in the price of Product 2}}$$

If a 5% increase in the price of coffee leads to a 7% decrease in the quantity demanded of cream, then the cross-price elasticity of demand is

$$\frac{-7\%}{+5\%} = -1.4.$$

If a 5% increase in the price of coffee leads to a 7% increase in the quantity demanded of tea, then the cross-price elasticity of demand is

$$\frac{+7\%}{+5\%} = +1.4.$$

A negative cross-price elasticity of demand, as in the case of coffee and cream, indicates complementary products. For complementary products, an increase in the price of one product is usually accompanied by a reduction in the quantity demanded of the other product. Conversely, a positive cross-price elasticity of demand characterises

substitute products in many, but not all, cases; it depends on how close of a substitute one product is for the other product. For example, coffee and tea are substitutes in the eyes of some people, but not all. So, there will be some cross-price elasticity between coffee and tea, but it might not be represented by a high number. Coke and Pepsi are considered closer substitutes and have a larger cross-price elasticity of demand. As discussed in Section 2.1.6.1, a decrease in the price of Coke may be accompanied by a reduction in the quantity demanded of Pepsi.

3.1.3 Interpreting Price Elasticities of Demand

Own and cross-price elasticities of demand are important in understanding the demand for products. If a product is easy to substitute because similar products exist, then the own price elasticity will be large and negative—that is, demand is elastic. If a product has no immediate substitutes, such as a new drug, or if use of the product is deeply entrenched by habit, such as tobacco, demand is inelastic.

Elasticity of demand helps market participants assess the effects of price changes. Investors and analysts use elasticity of demand to assess a company's potential as an investment. As discussed in Section 3.1.1, whether a company will see its sales increase or decrease as a result of a change in prices, and by how much, helps investors and analysts understand what drives a company's profit, which, in turn, affects its stock valuation.

Consider Coke and Pepsi again. Although each has its own brand loyalty among customers who are committed to one or the other, there are plenty of substitutes, including tap water. Some people are indifferent about the two brands and consider neither brand to be a necessity. If one of the two companies seeks to take market share from the other by cutting prices, what might happen? If Coca-Cola lowers its price, it might increase the number of units sold at the expense of Pepsi's sales, as discussed earlier. The lower price may also encourage some people to switch from tap water to Coke, providing even more new customers. But, assuming that Coke's production costs are still the same, the profit Coca-Cola makes on each unit sold is less. If Coca-Cola cuts its price too much, it may even incur a loss on each unit sold. Even though Coca-Cola might gain market share, it becomes a less attractive investment if it is a less profitable company. Thus, elasticities of demand are often a prime consideration for investors and analysts when they consider the pricing power of a company or industry and the potential effect on a company's bottom line (profit) if it tries to gain market share by cutting prices.

3.2 Income Elasticity of Demand

Income elasticity of demand is the percentage change in the quantity demanded of a product divided by the corresponding percentage change in income. It measures the effect of changes in income on quantity demanded of a product when other factors, such as the price of the product and the prices of related products, remain the same.

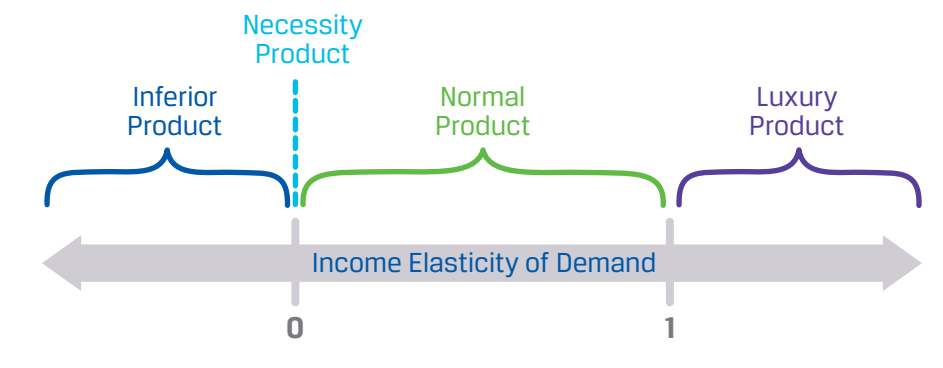
Most products have positive income elasticities, meaning that as consumers' income increases, they purchase a greater quantity of the product. As described in Section 2.1.3, products with positive income elasticities are called normal goods. In contrast, if consumers purchase less of a product as their income increases, the income

elasticity is negative and the products are called inferior goods. Consumers demand fewer inferior goods as their income increases and they substitute more expensive and desirable products, such as meat instead of potatoes or rice.

Income elasticity of demand also enables investors to distinguish between luxuries and necessities. A luxury product usually has an income elasticity of greater than one. A necessity product may have an income elasticity of approximately zero. Demand will not change with a change in income. Luxury items may include foreign travel and a golf club membership. What is perceived as a luxury item may change over time because income elasticities will change as a society's income improves. So, although a smartphone may be a luxury product at a certain income level, it may become a necessity product at another.

Exhibit 8 shows graphically the distinction between inferior, necessity, normal, and luxury products based on their income elasticity of demand.

Exhibit 8 Type of Product Based on Income Elasticity of Demand



PROFIT AND COSTS OF PRODUCTION

4

We have focused on supply and demand curves and how they influence equilibrium quantity and price. We have also looked at quantifying demand changes by using the elasticity concept. Now, we shift our attention to a company's production costs and how these costs influence the company's profitability. This is important because investors and analysts need to assess a company's potential to make profits.

4.1 Accounting Profit vs. Economic Profit

Although accountants and economists agree that profit is the difference between the revenues generated from selling products and services and the cost of producing them, they disagree about how to measure profit, primarily because they do not necessarily consider the same types of costs.

The difference between accounting profit and economic profit is best illustrated by an example. Consider the owner of a restaurant in France. For a particular period, the restaurant has revenues of 5,000,000 euros. The costs of operating the restaurant, which include renting the premises, paying the salaries of the staff, and buying the raw food, is 3,000,000 euros. The **accounting profit** considers only the explicit costs and is, in this example, 2,000,000 euros (5,000,000 euros – 3,000,000 euros).

Economists, however, take a broader view of costs and also deduct implicit costs from revenues and explicit costs to arrive at **economic profit**. The owner of the restaurant risks her capital by operating the restaurant. That is, if the restaurant fails, she loses all her money. She could have used her skills and risked her capital differently. Assume that the restaurant's owner could find employment, invest her capital and earn 1,600,000 euros from receiving a salary and from investing her capital elsewhere. The amount she would receive from these activities represents what economists call an opportunity cost. An **opportunity cost** is the value forgone by choosing a particular course of action relative to the best alternative that is not chosen. Because the owner forgoes 1,600,000 euros by operating the restaurant, the restaurant's accounting profit should be at least equal to this. Otherwise, operating the restaurant is an inefficient allocation of its owner's resources.

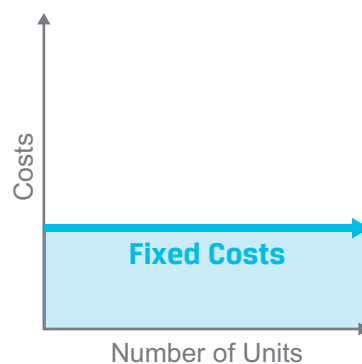
In this example, the economic profit from operating the restaurant is 400,000 euros—that is, the accounting profit of 2,000,000 euros minus the opportunity cost of 1,600,000 euros.

In conclusion, to calculate accounting profit, only explicit costs are considered. To calculate economic profit, both explicit costs and the implicit opportunity costs are considered.

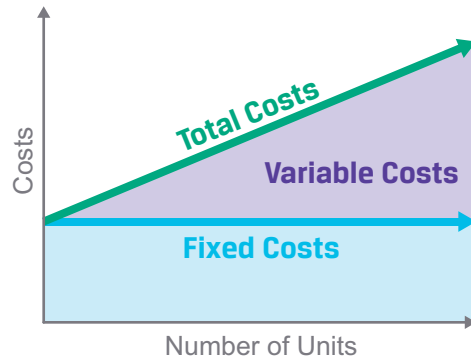
4.2 Fixed Costs vs. Variable Costs

Companies combine labour, capital equipment, raw materials, and managerial skills to produce products and services. Costs that do not fluctuate with the level of output of the company are called **fixed costs** or **overhead**, as shown in Exhibit 9A.

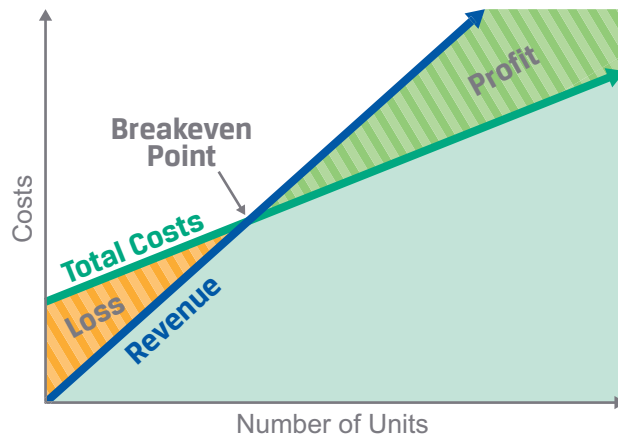
Exhibit 9A Fixed Costs



Fixed costs include costs associated with buildings and machinery, insurance, salaries of full-time employees, and interest on loans. In contrast, costs that fluctuate with the level of output of the company are called **variable costs**, as illustrated in Exhibit 9B.

Exhibit 9B Total Costs

For example, raw materials tend to be a variable cost because the more units the company produces, the more raw materials it needs. The sum of fixed costs and variable costs gives total costs, illustrated by the green line in Exhibits 9B and 9C.

Exhibit 9C Revenue Costs

The blue line in Exhibit 9C shows the company's revenues. If the revenues are higher than the total costs—the right side of the graph—the company is making a profit. By contrast, if the revenues are lower than total costs—the left side of the graph—the company is suffering a loss. The point at which the revenue and total costs lines intersect is called the **breakeven point**. It reflects the number of units produced and sold at which the company's profit is zero—that is, revenues exactly cover total costs.

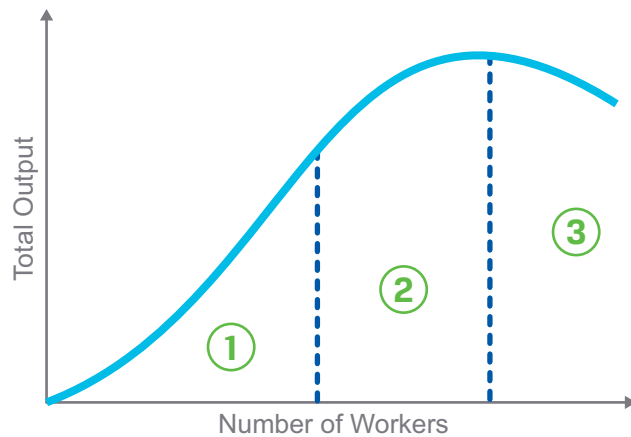
In the long run, all factors of production can be changed and some costs that are regarded as fixed become variable because, for instance, a company can relocate its facilities or purchase new equipment. Some costs, such as advertising, may be fixed but are also discretionary, meaning that the company can adjust spending on this.

When production first starts, fixed costs related to production will be incurred. As production increases, the average fixed costs or fixed costs per unit of output will decrease because the fixed costs are spread over more units. For example, the same building is used to produce more units of output. Average variable costs or variable costs per unit of output may also decrease a little but are generally fairly constant. Thus, average total costs or total costs per unit of output, which are the sum of both average fixed costs and average variable costs, should decrease as output expands.

The decrease in total costs per unit will continue until one or more factors of production reaches full capacity or breaks down and additional resources must be added. For example, machinery being used continuously, allowing no time for servicing, is likely to break down. Breakdowns result in reduced output, expensive repairs, and increased overtime as workers shift production to functioning machines. When this happens, additional fixed costs may be incurred, such as the purchase of a new machine. So, total costs per unit decrease until the point of full capacity and then increase as new fixed costs are incurred.

Economies of scale are cost savings arising from a significant increase in output without a comparable rise in fixed costs. These cost savings lead to a reduction in total costs per unit as a result of increased production. Economies of scale can be obtained if, for example, staff, buildings and machinery are unchanged but output increases, which results in lower fixed costs per unit and lower total costs per unit.

But although adding variable inputs of one factor, such as labour, to fixed inputs of production, such as machinery, increases total output, the gain in output will increase at a decreasing rate even if the fixed inputs of production remain unchanged. This economic principle is known as the **law of diminishing returns** and is illustrated in Exhibit 10. For example, suppose a factory has a fixed number of machines and hires additional workers to operate them and make more products. Total output may rise quite rapidly at first—the first area of increasing marginal returns. But the rate at which total output rises will eventually decline as the workers have to share the machines—the second area of diminishing marginal returns. Hiring more workers means that they will have to stand in line waiting for their turn at operating the machines. Hiring still more workers means that they may get in each other's way, potentially making the contribution of the additional workers negative—the area of negative marginal return. According to the law of diminishing returns, adding ever more variable inputs, such as workers, is self-defeating.

Exhibit 10 Law of Diminishing Returns

- ① Increasing marginal returns: Total output increases rapidly.
- ② Diminishing marginal returns: Total output increases but at a decreasing rate.
- ③ Negative marginal returns: Total output decreases.

4.3 Effect of Fixed Costs on Profitability

The relative level of fixed and variable costs has a significant effect on profitability. Imagine the investment needed to construct a steel mill (a factory or plant that produces steel). If production levels are very low, the fixed costs are massive relative to the revenues, and the steel mill will make a low profit or even suffer a loss. As production increases, variable costs will increase as a result of using additional inputs to the steel-making process, such as purchasing raw materials and using additional electricity. But as discussed before, the total costs per unit of steel produced will decrease because average fixed costs will fall. The steel mill will be increasingly profitable as output rises and its fixed costs are spread over more units.

The term **operating leverage** (or operational gearing) refers to the extent to which fixed costs are used in production. Companies with high fixed costs relative to variable costs, such as the steel mill, have high operating leverage. For these companies, higher output leads to lower total costs per unit until the full capacity is reached or breakdowns happen, at which point costs increase.

Companies and industries with high fixed costs thus have greater potential for increased profitability by increasing output. Examples of high-fixed-cost projects include the construction of a major gold or coal mine or the construction of a large-scale ship-building facility. Companies may add capacity by incurring additional fixed costs. For example, an airline can buy an additional aircraft and landing rights, or a retailer may open a new store. In these cases, economies of scale occur as fixed costs are spread over more passengers or retail customers.

As total costs per unit of a product decrease, profitability should improve, assuming that the appropriate price has been established. The cost to the company of producing an incremental or additional unit is known as the **marginal cost**. The amount of money a company receives for that additional unit is known as its **marginal revenue**. The general rule is that the marginal cost can be increased up to the point that it equals the marginal revenue. Producing to the point at which marginal revenue equals marginal cost will, in theory, maximise profit.

5

PRICING

So far, we have discussed key factors that affect the price at which a product can be sold, such as the product's characteristics, own price and cross-price elasticities of demand, income elasticity of demand, cost, supply, and the degree of competition. We will discuss competition and how it affects pricing decisions more thoroughly in Section 6.

If a product has no unique characteristics, substitute products can be easily found. Competitors may face price cuts by their rivals because substitute products compete mainly on price. Consider again the example of Coke and Pepsi. It is unlikely that the companies will be able to charge much more than it costs them to produce their products, because the competition between them forces prices to the lowest possible point at which profits can be made in the medium to long term.

However, if a product has a unique identity, it is less price sensitive, which gives its producer the ability to charge higher prices and obtain higher profits. For example, one bottle of water may be very similar to another in terms of taste and chemical composition, but experience indicates that consumers perceive that there is a difference. Some marketers of bottled water have achieved substantial product differentiation and are able to charge a higher price for their water. Although most people think of pricing as a product's production cost plus a mark-up chosen by the producer, the mark-up is in fact determined by the product's uniqueness and substitutability.

In addition, if demand for a product is greater than the amount supplied, competing products will benefit. Suppliers of similar products will be able to raise their prices and achieve a higher mark-up or profit.

Income levels and elasticity also influence the pricing of products. Producers within an industry, such as mobile communications, may have more pricing power as a group as disposable income increases. But which companies benefit the most depends on the existence of close substitutes and consumer perceptions. The perceived superiority of the Apple iPhone, for example, may give Apple greater pricing power than companies that manufacture similar phones that are regarded as inferior in quality.

Prices also increase when supply is limited. If the supply of oil is interrupted by a war, for example, buyers frantically chase the limited supplies and bid up prices. Fuel and heating oil prices will be affected because the underlying cost of the product—the raw material oil—is more expensive. Oil is unique in that consumers and companies cannot easily find substitutes in the short term. In summary, an investor's or analyst's need to evaluate the uniqueness and substitutability of a product in assessing its pricing power.

MARKET ENVIRONMENT

6

The market environment in which a company operates influences its pricing, supply, and efficiency. It may be categorised according to the degree of competition. At one extreme, where there is a high degree of competition, a market is said to be perfectly competitive. At the other extreme, where there is no competition, a market is said to be a **monopoly**. Most markets lie between these two extremes.

6.1 Perfect Competition

A **perfectly competitive market** consists of buyers and sellers trading a uniform product—for example, trading wheat or rice. No single buyer or seller can affect the market price by buying or selling or by indicating their willingness to buy or sell a certain quantity. Buyers in perfectly competitive markets are said to be price takers. Equally, a seller cannot charge more than the market price because buyers can obtain whatever quantity they demand at the market price.

In a perfectly competitive market, marketing, research and development, advertising, and sales promotions play little or no role in driving demand and setting prices. Companies usually earn normal profits, which compensate the owners of the companies for their opportunity cost. Although it is possible in a perfectly competitive market for a company that creates a new product to earn abnormal profits—that is, profits in excess of the opportunity cost—it usually only lasts for a short time.

Barriers to entry are obstacles, such as licences, brand loyalty, or control of natural resources, that prevent competitors from entering the market. Barriers to entry in a perfectly competitive market are low to non-existent, meaning that other companies can easily enter the market. The entry of other companies causes an increase in the market supply and in the long run, abnormal profits are eliminated and only normal profits are earned.

The advantages of a perfectly competitive market are that resources are more likely to be allocated to their most efficient use and companies operate at maximum efficiency.

6.2 Pure Monopoly

Consider an industry with a single company that produces a product for which there are no close substitutes. There are significant barriers to entry that prevent other companies from entering the industry. Such an industry is called a **pure monopoly**. For example, Microsoft provides the majority of operating systems for personal computers. Although it is not a pure monopoly, Microsoft is close to being one. Utility companies, such as electricity, water, and natural gas, tend to be natural monopolies.

Natural monopolies exist when competition is not possible for various reasons. Consider, for instance, the large amount of capital that is needed to set up a competing nuclear power plant. A potential competitor may not want to or may not be able to enter the market because of the huge amount of capital required.

Because such companies as utility companies provide essential services, many monopolies are regulated and the government approves their prices, sometimes called rates. Typically, the government allows the company to set prices that will yield what is called a fair return. Examples of government-regulated monopolies include power companies and companies that provide national postal services.

A monopolistic company has an advantage in its ability to command higher prices and generate relatively larger profits. But a potential benefit to consumers is that the monopolistic company may conduct considerable research and development in order to innovate and maintain its monopoly. These innovations may benefit consumers. For example, a pharmaceutical company that generates abnormal profits may try to develop as many unique and useful drugs as it can to drive profit growth.

Often, the large scale of their operations also enables monopolistic companies to exploit economies of scale that may lower costs to consumers. However, compared with companies operating in a perfectly competitive market, a monopolistic company is likely to charge higher prices and have a lower total volume of products and services.

6.3 Monopolistic Competition

Monopolistic competition is distinct from a monopolistic company. **Monopolistic competition** characterises a market where there are many buyers and sellers who are able to differentiate their products to buyers. Thus, products trade over a range of prices rather than at a single market price. There are typically no major barriers to entry.

Each company may have a limited monopoly because of the differentiation of its product. Examples of companies in this type of market include restaurants, clothing shops, hotels, and consumer service businesses. For example, there may be a number of clothing shops in a shopping centre, but there may be only one that sells a particular fashion brand. That particular fashion brand may compete with other fashion brands, but for people who desire only that brand, only one shop will satisfy their demand. That shop is a monopoly market for this customer. But customers who have no preference have a choice between different merchandise sold at different price points, so all the clothing shops in the shopping centre can compete for these customers.

6.4 Oligopoly

An **oligopoly** is a market dominated by a small number of large companies because the barriers to entry are high. As a consequence, companies are able to make abnormal profits for long periods. Oligopolies exist in the oil industry, telecommunications industry, and in some countries, the banking industry.

Because of the large size of each company in the market, one company's actions affect other companies significantly. A company that cuts prices will need to consider the possible reactions of the other companies in the industry. Given this degree of interdependence, there is a tendency for collusion in markets characterised as oligopolies. Collusion in this setting is often an agreement between competitors to try to raise prices. This practice is usually illegal or prohibited by regulators because competition is a necessary ingredient for functioning capitalism; unfair advantages

caused by collusion make markets less efficient and are detrimental to consumers, who are forced to pay prices that may be excessive. However, laws and regulations cannot prevent occasional cases of competitors colluding by limiting production or setting high prices.

A **cartel** is a special case of oligopoly in which a group jointly controls the supply and pricing of products or services produced by the group. An example of a cartel is the Organization of the Petroleum Exporting Countries (OPEC), which sets the production and pricing of oil.

SUMMARY

Every time you buy or sell a product, or try to assess the value of a product or service, you are effectively applying microeconomics. You may directly use microeconomics in your everyday work. Even if you do not, it is very likely to be used by others in your workplace to make business and investment decisions. Microeconomics is an important concept in investing, so knowing about it will help you better understand the industry in which you work.

Some important points to remember about microeconomics include the following:

- Economics is the study of production, distribution, and consumption.
- Microeconomics is the study of how individuals and companies make decisions to allocate scarce resources.
- Macroeconomics is the study of an economy as a whole.
- Demand is the desire for a product or service coupled with the ability and willingness to pay a given price for it.
- The law of demand states that the quantity demanded and price of a product are usually inversely related.
- The demand curve shows the quantity of a product demanded at different prices. It is usually downward sloping from the left to the right, with quantity demanded on the horizontal axis and price of the product on the vertical axis.
- When the only thing that changes is the price, the change in the price of a product leads to a move along the demand curve, not a shift in the demand curve.
- Factors that may cause the demand curve to shift include consumers' income, the expected future price of the product, changes in general tastes and preferences, and the prices of other products. If the change in a factor makes a product more attractive, the demand curve will shift to the right, meaning that people will demand more of the product at a given price. Alternatively, if the change in a factor makes the product less attractive, the demand curve will shift to the left, meaning that people will demand less of the product at a given price.

- According to the income effect, if consumers have more purchasing power, the quantity of products purchased may increase. Increases in income lead to an increase in demand for normal products and a decrease in demand for inferior products.
- If consumers expect that the price of a product will increase in the future, the current quantity demanded may increase as consumers accumulate the product to avoid paying a higher price in the future.
- If consumers' tastes and preferences change and they stop liking the product as much, the quantity demanded at each price will decrease.
- A substitute product is a product that could generally take the place of another product. According to the substitution effect, consumers substitute relatively cheaper products for relatively more expensive ones.
- Complementary products are products that are frequently consumed together. When the price of a product decreases, it may lead to an increase in demand for the product and its complementary products.
- The supply curve represents the quantity supplied at different prices. The law of supply states that when the price of a product increases, the quantity supplied increases too. Thus, the supply curve is upward sloping from left to right.
- Market equilibrium occurs when, at a particular price, no buyer or seller has any incentive or desire to change the quantity demanded or supplied, all other factors remaining unchanged.
- The price at which the quantity demanded equals the quantity supplied in a market is known as the equilibrium price. This price is the one at which the demand and supply curves intersect and it is the only price at which suppliers and consumers are both content, with no desire to change the quantity produced or bought.
- Elasticity refers to how the quantity demanded or supplied changes in response to small changes in a related factor, such as price, income, or the price of a substitute or complementary product. If a product's quantity demanded or supplied is responsive to changes in a factor, its demand or supply is said to be elastic. Demand or supply is said to be inelastic if a product's quantity demanded or supplied does not change significantly in response to a change in the factor.
- Own price elasticity of demand is the percentage change in the quantity demanded of a product as a result of a percentage price change in that product. The sign and magnitude of the own price elasticity helps a company set its pricing strategy.
- Cross-price elasticity of demand is the percentage change in the quantity demanded of a product in response to a percentage price change in the price of another product. A negative cross-price elasticity of demand indicates complementary products, whereas a positive cross-price elasticity of demand characterises substitute products in many but not all cases.
- Income elasticity of demand measures the effect of changes in income on quantity demanded of a product when other factors, such as the price of the product and the prices of related products, remain the same. Products with positive

income elasticities are called normal products, whereas products with negative income elasticities are called inferior products. Income elasticity of demand also enables investors to distinguish between luxuries, which have income elasticity greater than one, and necessities, which have an income elasticity of approximately zero.

- Profit is the difference between the revenue generated from selling products and services and the cost of producing them. Accounting profit considers only the explicit costs, whereas economic profit takes into account both explicit costs and the implicit opportunity costs. Opportunity costs capture the value forgone by choosing a particular course of action relative to the best alternative that is not chosen.
- Fixed costs do not fluctuate with the level of output, whereas variable costs do. As production increases, average total costs, which include both average fixed costs and average variable costs, decrease because the fixed costs are spread over more units. Increased production allows producers to benefit from economies of scale, the cost savings arising from a significant increase in output without a simultaneous increase in fixed costs.
- Companies with high fixed costs relative to variable costs have high operating leverage and have greater potential for increased profitability by increasing output.
- Producing to the point at which marginal revenue, the amount of money a company receives for an additional unit, equals marginal cost, the cost to the company of producing the additional unit, will in theory maximise profit.
- Key factors that affect the price at which a product can be sold are its characteristics, own price and cross-price elasticities of demand, income elasticity of demand, cost, supply, and the degree of competition.
- The market environment in which a company operates influences its pricing, supply, and efficiency. It may be categorised according to the degree of competition. A perfectly competitive market is one extreme, a monopoly is the other extreme, and most markets lie between these two extremes.
- In a perfectly competitive market, buyers and sellers trade a uniform non-differentiated product, and no single buyer or seller can affect the market price. Barriers to entry are low, the degree of competition is high, and companies usually earn normal profits.
- In a pure monopoly, a single company produces a product for which there are no close substitutes. There are significant barriers to entry that prevent other companies from entering the industry. A monopolistic company is likely to charge higher prices, have a lower total volume of products and services, and may earn higher profits.

- In monopolistic competition, there are many buyers and sellers who are able to differentiate their products to buyers. Each company may have a limited monopoly because of the differentiation of its products. Thus, products trade over a range of prices rather than a single market price. There are typically no major barriers to entry.
- An oligopoly is a market dominated by a small number of large companies because the barriers to entry are high. As a consequence, companies are able to make abnormal profits for long periods. A cartel is a special case of oligopoly.

CHAPTER REVIEW QUESTIONS

- 1 Economics is the study of:
 - A an economy as a whole.
 - B choices in the presence of limited or scarce resources.
 - C how individuals and companies make decisions to allocate limited resources.
- 2 If the price of chocolate increases, the quantity of chocolate demanded will *most likely*:
 - A increase.
 - B decrease.
 - C remain unchanged.
- 3 Which of the following would *most likely* cause a steel manufacturer to increase the quantity supplied? An increase in:
 - A input costs.
 - B corporate taxes.
 - C the price of steel.
- 4 If consumers demand more of a good than sellers find profitable to produce, then sellers' inventories will tend to:
 - A deplete.
 - B pile up.
 - C remain unchanged.
- 5 Holding all other factors constant, if the price of a product increases, the demand for a substitute product is *most likely* to:
 - A increase.
 - B decrease.
 - C remain unchanged.

- 6 Holding all other factors constant, if the demand for printers increases, the demand for ink cartridges is *most likely* to:
- A increase.
 - B decrease.
 - C remain unchanged.
- 7 Market equilibrium is a state in the market when, at a particular price and with all other factors remaining unchanged, no buyer or seller has any incentive or desire to change the:
- A quality of a product that is demanded or supplied.
 - B market for a product that is demanded or supplied.
 - C quantity of a product that is demanded or supplied.
- 8 Which of the following statements *best* describes price inelasticity? A small change in price produces a:
- A proportional change in demand.
 - B less than proportional change in demand.
 - C disproportionately larger change in demand.
- 9 If revenues decrease when the price of a good increases, the price elasticity of this good is *most likely*:
- A elastic.
 - B inelastic.
 - C unit elastic.
- 10 For a particular period, a golf course generated revenues of \$10,000,000 and incurred costs of \$5,000,000. In addition, the implicit costs were \$1,000,000. The accounting profit is *most likely*:
- A lower than the economic profit.
 - B the same as the economic profit.
 - C higher than the economic profit.
- 11 Which of the following costs is *most likely* a variable cost for a manufacturing plant?
- A Energy costs
 - B Interest expense
 - C Insurance expense

- 12 Which of the following statements *best* describes the effect of lower production on a manufacturing plant's costs per unit? Average:
- A total cost will decrease.
 - B fixed cost will decrease.
 - C variable cost will remain fairly constant.
- 13 Which of the following factors is *most likely* to affect the pricing of a service?
- A Production costs
 - B Average age of the workforce
 - C Availability of complementary products
- 14 An industry dominated by a small number of large companies is *most likely* a(n):
- A monopoly.
 - B oligopoly.
 - C perfect competition.

ANSWERS

- 1 B is correct. Economics is the study of choices in the presence of limited or scarce resources (labour, real assets, financial capital, etc.). Macroeconomics is the study of an economy as a whole. Microeconomics is the study of how individuals and companies make decisions to allocate limited resources.
- 2 B is correct. The law of demand states that the quantity demanded and the price of a product are inversely related. If the price of chocolate increases, then the quantity of chocolate demanded should decrease. A and C are incorrect because the law of demand suggests that as the price of a product increases, the quantity demanded will decrease, not increase or remain unchanged.
- 3 C is correct. The law of supply states that when prices increase, the quantity supplied by companies will increase. Movements along the supply curve occur when only the price changes. A is incorrect because an increase in input costs would cause the supply curve to shift to the left and the manufacturer to offer the same quantities of steel at higher prices or smaller quantities at the same prices. B is incorrect because an increase in corporate taxes would cause the supply curve to shift to the left and the manufacturer to offer the same quantities of steel at higher prices or smaller quantities at the same prices.
- 4 A is correct. When the price of a good is below the equilibrium price, consumers will demand more of the good than producers will find profitable to sell and inventories will be depleted. B is incorrect because inventories pile up when companies are willing to supply more of a good than consumers are willing to buy. C is incorrect because sellers' inventories are affected by consumer demand and will not remain unchanged.
- 5 A is correct. When the price of a product increases, the demand for substitute products also increases. B is incorrect because the demand for a complementary product, not a substitute product, will decrease if the price of the product increases. C is incorrect because the demand for a substitute product will increase if the price of a product increases.
- 6 A is correct. Printers and ink cartridges are complementary products. Thus, if the demand for printers increases, the demand for ink cartridges increases as well. B is incorrect because the demand for ink cartridges would decrease if the demand for printers increased if printers and ink cartridges were substitute products, not complementary products. C is incorrect because printers and ink cartridges are complementary products. Thus, an increase in demand for printers will increase the demand for ink cartridges.
- 7 C is correct. Market equilibrium is a state in the market when at a particular price, no buyer or seller has any incentive or desire to change the quantity of a product that is demanded or supplied, all other factors remaining unchanged. A is incorrect because market equilibrium is a price at which there is no excess supply or demand and it does not consider the quality of the product. B is incorrect because market equilibrium relates to the quantity of a product that is demanded or supplied at a particular price, not the market for the product.

- 8** B is correct. If price elasticity is low or inelastic, changes in price are accompanied by less than proportional changes in the quantity demanded. This means demand is not very price sensitive. A is incorrect because a small change in prices would produce a proportional change in demand for a good exhibiting unit elasticity. C is incorrect because a small change in price would produce a disproportionately larger change in demand for a good exhibiting high price elasticity.
- 9** A is correct. For elastic goods, an increase in price will lead to a greater percentage decrease in quantity and a decrease in revenues. B is incorrect because for inelastic goods, a decrease in price will lead to a decrease in revenues. C is incorrect because price changes do not affect total revenue for goods that are unit elastic.
- 10** C is correct. Accounting profit considers only explicit costs and would be derived from the difference between revenues and direct costs ($\$10,000,000 - \$5,000,000 = \$5,000,000$). A is incorrect because economic profit deducts implicit costs from accounting profit ($\$10,000,000 - \$5,000,000 - \$1,000,000 = \$4,000,000$). B is incorrect because accounting profit and economic profit are not the same when there are implicit costs.
- 11** A is correct. Energy costs are variable costs that are sensitive to the level of production. B is incorrect because interest expense is often a fixed cost and does not vary with the level of production. C is incorrect because insurance expense is often a fixed cost and does not vary with the level of production.
- 12** C is correct. Average variable cost or variable cost per unit of output is generally constant as production changes. A is incorrect because average total cost should increase as output decreases. B is incorrect because average fixed cost will increase. The fixed costs are being spread over fewer units of production.
- 13** A is correct. Production costs are considered when pricing the service. B is incorrect because the average age of the workforce does not affect pricing. C is incorrect because the availability of substitute products will affect pricing, not the availability of complementary products.
- 14** B is correct. Oligopolies are dominated by a small number of large companies because the barriers to entry are high. A is incorrect because a monopoly is a market with a single company that produces a product for which there are no close substitutes and with significant barriers to entry. C is incorrect because in perfect competition there are many buyers and sellers trading in a uniform commodity and there are no major barriers to entry.