Define the term unemployment and explain how it is calculated

Low levels of unemployment is a key macroeconomic objective of most governments. Unemployment occurs when those who are actively seeking work are unable to find work. Therefore those who are not working are not necessarily counted as unemployed. People must be actively seeking work. For example housewives and househusbands, retired people, students, and those not legally allowed to work such as school children and prisoners are not working but are not looking for work and therefore are not counted as unemployed. People who are both not working and not actively seeking work are not part of the labour force. The labour force is made up of the employed and those actively seeking work and as such are described as being economically active.

The labour force participation rate is the percentage of the working-age population that is economically active. The meaning of working-age population varies from country to country because countries have different retirement ages and ages at which young people are legally allowed to leave school and look for full-time work.

The unemployment rate is calculated as a percentage using the following formulae.

\[
\text{Unemployment rate (UR)} = \frac{\text{the total number of unemployed} \times 100}{\text{the labour force}}
\]

Calculate the UR from data (HL)

A country has a labour force of 20 million people. This means that 20 million people are working or actively seeking work. The number of people unemployed is 4 million.

\[ UR = \frac{4 \text{ million}}{20 \text{ million}} \times 100 = 0.2 \times 100 = 20\% \]

Calculate the size of the labour force when the unemployment rate is 15% and the number unemployed is 10 million.

\[ 15 = \frac{10}{LF} \times 100 \]

simplify by multiplying both sides by LF

\[ 15 \times LF = 1000 \]

simplify by dividing both sides by 15

\[ LF = 1000/15 = 66.67 \]

The labour force is 66.67 million.

Calculate the number unemployed when the UR rate is 5% and the labour force is 25 million.

\[ 5 = \frac{\text{unemployed}}{25 \text{ million}} \times 100 \]

simplify by multiplying both sides by 25 million

\[ 5 \times 25m = \text{unemployed} \times 100 \]

simplify by dividing both sides by 100

\[ 125 \text{ million} = \text{the number of unemployed} = 1,250,000 \]

Explain the difficulties associated with measuring unemployment

Government employment statistics are not always an accurate indicator of the true level of unemployment in an economy. Discussed below are the reasons for this.

Subject vocabulary

- **unemployment** occurs when there are people actively looking for work at the equilibrium wage rate but are not able to find work
- **labour force** people who are working or who are actively seeking work
- **economically active** describes people of working age who are employed or actively seeking employment
- **unemployment rate** the percentage of people in the labour force who are unemployed
The number of people working part-time in the UK has grown over the last few years. Many people who have taken on these part-time jobs did so because they were unable to find full-time jobs. Although they want to work longer hours and are underemployed they are not officially classified as unemployed because they are working. These people are not contributing as much as they would like to the output of the country.

Many people take jobs because they are unable to find the type of work that they are qualified to do. Some people who have been searching for work for a long period of time become very frustrated and eventually drop out of the labour force entirely because they believe they will never find suitable employment. As they are not actively looking for work they are not counted as unemployed and yet their potential contribution to economic growth is wasted. The type of unemployment discussed above is hidden unemployment and is not taken into account when calculating the UR. Therefore the UR is not necessarily a valid indicator of the true level of unemployment and the welfare of households. The UR underestimates the true level of unemployment.

A country’s UR rate is calculated for the whole country. The rate however can vary dramatically across regions. Also the UR varies across different age groups. The UR rate of young adults in Spain in 2013, for example, is higher than the national average. Unemployment maybe higher amongst women, particularly when women find it hard to find full-time work and have to take part-time jobs. They are often underemployed. Some employers discriminate against particular ethnic groups. Therefore the unemployment rate of these groups is often higher than the national average. Also firms are reluctant to employ people if they do not speak the national language.

**Model sentence:** Distribution of unemployment is unequal due to geographical, age, ethnic, and gender disparities.

Discuss the costs of unemployment for the economy, society, and households

There are many costs to households, society, and the economy associated with unemployment. Unemployment is a waste of a scarce resource. Fewer goods and services are produced than is possible. Output is below the full employment levels of output. The higher the level of unemployment the bigger the deflationary gap. Aggregate demand is relatively low. Total expenditure in the economy is not sufficient to buy all the goods and services that could be made if all factors of production are fully utilized.

Discuss the private costs of unemployment

The costs borne by the people who are unemployed are called private costs. They suffer from low levels of income and have a lower standard of living than those employed. The amount of wants they can satisfy are limited by the purchasing power of their income. They suffer a fall in welfare.

In some countries the unemployed receive relatively generous unemployment benefit but in others no or very low benefit payments are provided by the government and therefore the unemployed struggle to satisfy their basic needs.

The children of those unemployed also are adversely affected. Statistically children of the long-term unemployed are less likely to enjoy a good standard of living in adulthood. Cancer rates and obesity rates, for example, are higher amongst poorer members of the community. Mental health problems such as depression are also associated with low levels of income as is family breakdown.

Discuss the external costs of unemployment

Those who are unemployed for long periods of time become deskilled thereby reducing their chances of finding work. There is a connection between long-term unemployment and health problems. Those unemployed for long periods are statistically more likely to be involved in criminal activity such as theft and vandalism. Therefore there are costs associated with unemployment that must be borne by society. These are called external costs. They are the costs that are paid for by third parties such as the taxpayer. External costs include the cost to the taxpayer of police work associated with crime, the extra cost to the judicial system and the cost of keeping more people in prison. And there are the additional costs of medical treatment paid for by the taxpayer.
Discusses the effects on the government of unemployment

National income and expenditure are at a relatively low level, therefore the government collects less tax revenue. Income tax revenues fall as unemployment rises and indirect tax revenue, revenue raised from the tax charged on the sale of goods and services, also falls. As expenditure falls profit earned by firms falls leading to a fall in revenue from corporation tax.

As unemployment rises, total benefit payments made by the government to the unemployed increase. Also, government pays for the external costs associated with unemployment. This represents a significant opportunity cost. As revenues fall and government expenditure increases, the country's budget position worsens. A budget deficit is likely to occur. The government must borrow from the financial markets in order to fund the shortfall. This increases the size of the national debt, leading to an increase in interest payments on the debt.

Discusses the effects on business investment and international competitiveness of unemployment

With low levels of expenditure and increasing unemployment, firms do not feel confident about future economic prospects and are less likely to invest in new capital thereby reducing AD even further. This lack of expenditure and investment means that the country does not remain competitive as average costs of production rise above those of its international competitors. Demand for the country's exports falls leading to a fall in net exports, a component of AD. As the incomes of those who lose their jobs fall, there is an increase in income inequality. The distribution of income becomes more unequal. (Distribution of income is discussed in detail on pages 164–67.)

Model sentence: There are both the private costs and the external costs (negative externalities) caused by unemployment. Tax revenues fall and government expenditure rises leading to a budget deficit and increases in the national debt.

Test your understanding of this unit by answering the following questions

- A country has a labour force of 15 million people. The number of people unemployed is 3 million. Calculate the unemployment rate.
- Explain the costs of unemployment to individuals, society, and the economy.
- Explain the limitations of the unemployment rate.

Subject vocabulary

| National income | The sum of all income earned in a country in a given period of time |
| Corporation tax | A tax levied in the UK on company profits |
| Government expenditure | Spending by a government in a specified period of time on such things as transport infrastructure, welfare benefits, national defense, education, and health services which is financed by tax revenue and borrowing |
| Budget deficit | Occurs when government expenditure is greater than tax revenue |
| National debt | The total amount of money a government has borrowed. When a government runs a budget deficit, it must borrow the difference thereby adding to the national debt |
| Interest payments | The money paid at regular intervals on loans |
| Capital | Manufactured goods that are used in the production of other goods |
| Net exports | Export revenue minus import expenditure |
| Income inequality | A measurement of the distribution of income showing the differences between the amount of income earned by different households in the economy |

Learning outcomes

- Describe, using examples, the meaning of frictional, structural, seasonal, and cyclical (demand-deficient) unemployment.
- Distinguish between the causes of frictional, structural, seasonal, and cyclical (demand-deficient) unemployment.
- Explain, using a diagram, that cyclical unemployment is caused by a fall in aggregate demand.
- Explain, using a diagram, that structural unemployment is caused by changes in the demand for particular labour skills, changes in the geographical location of industries, and labour market rigidities.
- Evaluate government policies to deal with the different types of unemployment.

Subject vocabulary

| Structural unemployment | Unemployment caused by a change in the type of labour firms demand. It is caused by a mismatch of the skills of those unemployed and the skills needed by firms. |

Explain the differences between, and causes of, the different types of unemployment

The two most important types of unemployment are structural unemployment and cyclical unemployment. Cyclical unemployment is also known as demand-deficient unemployment or Keynesian unemployment.

The demand for labour is a derived demand. Firms demand labour in order to produce output. Therefore the demand for labour is derived from the demand for goods and services. As aggregate demand increases, firms respond by increasing output. In order to increase output firms employ more workers therefore unemployment falls. As aggregate demand falls, firms respond by reducing output. Fewer workers are now required to produce fewer goods and services therefore unemployment rises. This is called cyclical unemployment.
because the numbers employed depends upon where the economy is in the business cycle. In a boom total expenditure (AD) is relatively high. Firms wish to produce more goods therefore unemployment falls. As AD falls the economy begins to slow down. Fewer workers are required and unemployment rises. This is why this type of unemployment is called demand-deficient unemployment. It is caused by a lack of aggregate demand. This type of unemployment changes with the business cycle and so is temporary. As an economy moves out of recession cyclical unemployment falls as firms employ more workers in order to raise output.

As total expenditure falls the aggregate demand curve shifts down and to the left from AD₁ to AD₂. In response firms reduce output from Y₁ to Y₂. The deflationary gap increases from Y₁ - Y₂ to Y₃ - Y₄ and the price level falls from P₁ to P₂. Total expenditure is not sufficient to buy all the goods and services that can be produced at the full employment level of output, Y₄. Workers become unemployed due to a lack of aggregate demand.

Figure 51.1

Structural unemployment is caused by changes in the structure of industries in a country. In the UK, for example, over the last few decades there have been major changes in the types of industries. Heavy industry, such as mining and ship building, has all but disappeared. Manufacturing industries in general now contribute significantly less to GDP. There has been a move away from heavy industry and manufacturing towards the tertiary sector or service sector. The skills needed by industries have changed. Some workers’ skills do not match those now in demand. Workers are occupationally immobile. They cannot obtain work in the emerging industries because they do not have the required skills. The skills they do have are now not in demand and therefore workers are unable to gain employment.

Figure 51.2 represents the labour market for manufacturing workers. Structural changes, caused by a move away from manufacturing towards the service sector leads to a fall in the demand for manufacturing workers. Fewer workers are demanded at each wage rate causing the demand for labour curve to shift down and to the left and leading to an excess supply of labour at the original equilibrium wage of $16 per hour. Wage falls to $12 per hour to eliminate the excess supply and equilibrium quantity of workers employed in manufacturing falls from Q₁ to Q₂. As time goes by demand falls even more leading to more structural unemployment in this sector.

Figure 51.2

Structural unemployment occurs in developing countries as the economy moves away from producing agricultural output to producing manufactured goods. The demand for those with farming skills falls and the workers become unemployed. As economies grow they move away from reliance on the agricultural sector and structural unemployment increases. This also occurs when a country moves away from manufacturing to the service sector.

A flexible labour market is one in which workers are willing and able to respond to changes in the pattern of demand for labour and to changes in the wage rate. If workers are occupationally mobile it means they have skills that are demanded by industry. The greater the number of skills the more occupationally flexible the labour force is and the quicker it is able to adapt to structural changes thus reducing levels of structural unemployment.

Industries sometimes relocate, normally in order to reduce costs. Workers are often unable to move to where the industry has relocated. They are geographically immobile. This can be because of the high cost of moving from one region to another or simply because they do not want to move because of family and social ties. The cost of commuting to and from work may also act as a barrier to mobility. People in this situation find themselves unemployed because their skills are no longer demanded in the region they live and they are unwilling or unable to relocate. Geographical immobility leads to excess supply of certain types of labour in

Subject vocabulary

continued from page 140

cyclical/demand-deficient unemployment/ Keynesian unemployment unemploymet caused by a lack of aggregate demand. Unemployment changes as the economy goes through the business cycle, increasing when AD falls and decreasing when AD rises.

business cycle the fluctuations in economic activity over time. There are four stages of the business cycle: recession, trough, recovery, and peak/boom.

deflationary (recessionary) gap the situation in which the actual output of an economy is less than its potential output.

price level the current weighted average price of a selected group of goods and services produced in a country over a period of time.

full employment level of output the potential quantity of output that can be produced in an economy when all factors of production are employed.

manufacturing industries industries that use labour and capital to turn raw materials and components into finished goods.

GDP Gross Domestic Product is the monetary value of all the finished goods and services produced within a country in a given period of time, usually measured over a year.

tertiary sector the part of the economy concerned with the provision of services.

occupationally immobile occurs when workers do not have the necessary skills to change jobs.

wage rate the amount of money paid to labour per unit of time or unit of output.

excess supply occurs when quantity supplied is greater than quantity demanded.

goingly immobile describes workers who are unable to relocate in order to find work, often because of the high costs of moving.
Subject vocabulary

- **trade unions** an association of employees whose aim is to negotiate with employers over pay and working conditions using the collective power of the members of the trade union

- **minimum wage** the minimum amount of money a firm is legally allowed to pay a worker for one hour’s work

- **equilibrium wage** the wage at which the quantity of labour supplied is equal to the quantity of labour demanded

- **forces of demand and supply** changes in the determinants of demand and supply in a market that affect the market price and the allocation of resources

- **wage rigidity** occurs when wages do not change as the demand or supply of labour changes

- **free labour market** a labour market in which no intervention takes place, so the wage rate is determined solely by the demand and supply of labour

- **capital-intensive** describes production that requires a large amount of capital relative to the amount of labour

- **labour-intensive** describes production that requires a large amount of labour relative to the amount of capital

- **fiscal policy** government policy designed to achieve macroeconomic objectives through government expenditure and taxation

- **monetary policy** the control of the supply of money by the government to affect the economy (e.g., changing interest rates)

- **disposable income** household income after direct taxation has been deducted

- **marginal propensity to consume** is the proportion of additional income that an individual spends on goods and services. MPC = the change in consumption divided by the change in income.

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Evaluate government policies to deal with the different types of unemployment

**Demand-deficient unemployment**

Demand-deficient unemployment is caused by low levels of aggregate demand therefore government could introduce policies with the aim of increasing aggregate demand. \( AD = C + I + G + (X - M) \). The government through changes in policy, can try to affect the components of AD. Policies that are aimed at changing AD are called demand-side policies. There are two types of demand-side policies: **fiscal policy** and **monetary policy**.

Fiscal policy involves taxation and government expenditure. If the government reduces the tax on household income the total amount of disposable income in the economy rises. Households will spend a proportion of the extra income on domestically produced goods and services thereby increasing AD.

**Model sentence:** The actual increase in AD depends on households’ aggregate marginal propensity to consume. The higher the MPC the greater the increase in consumption and therefore the greater the fall in demand deficient unemployment. (See pages 134–37 for a detailed explanation of marginal propensity.)
If households save or spend most of the extra income on imports, the marginal propensity to withdraw would be relatively high and the increase in consumption on domestically produced goods will be less. If a country has a relatively high MPW then the increase in disposable income will have less impact on AD.

**Model sentence:** An increase in consumption increases AD and firms respond by employing more workers in order to increase output leading to a fall in demand-deficient unemployment.

If households expect the economy to grow in the future and think that their jobs are secure then the MPC will be relatively high leading to a greater fall in unemployment. If households are less optimistic then they are more likely to save the extra disposable income or pay back existing debt. Therefore the increase in consumption will not be as great and the effect of the fiscal policy on unemployment will not be as big. Increases in AD cause induced investment. Firms increase investment in order to increase output in response to higher levels of consumption. Investment is a component of AD therefore AD rises even further as firms invest.

The government could reduce the rate of corporation tax leaving firms with higher after-tax profit. Ceteris paribus, investment rises leading to an increase in AD. Investment is an injection into the circular flow of income model and is subject to the Keynesian multiplier (see pages 134–37). Higher levels of investment causes further increases in income and expenditure. Therefore AD increases by more than the initial investment leading to a greater fall in unemployment.

The government could reduce indirect taxes such as VAT and duty charged on the sale of goods and services. A reduction in indirect tax in effect reduces the costs of production causing the SRAS curve to shift down and to the right. The price level falls leading to an increase in quantity demanded. A fall in the price level increases households’ real income therefore consumption rises and unemployment falls.

The government could increase government expenditure. It could invest in transport infrastructure for example. Government expenditure is a component of AD and an injection into the circular flow of income model. Like private investment by firms, government expenditure is subject to the multiplier causing increases in income and expenditure greater than that caused by the initial expenditure.

However, expansionary fiscal policy can lead to a worsening budget deficit (occurs when government expenditure > tax revenue) because tax revenue falls at the same time as government expenditure increases. The government must borrow more money from the financial sector leading to increases in the national debt. The debt and the interest charged on the debt must be repaid by the taxpayers in the future, thereby reducing the future taxpayers’ disposable income and their levels of consumption.

The government could introduce an expansionary monetary policy by reducing the interest rate. As the cost of borrowing falls households are more likely to borrow money from banks in order to buy relatively more expensive goods, such as cars, leading to an increase in household consumption. The interest payment on existing loans also falls thereby increasing households’ discretionary incomes leaving people with more money to spend on goods and services. AD rises and unemployment falls. Again, confidence about the future of the economy has a major effect on the amount of the extra income that households spend rather than save.

As interest rate falls, ceteris paribus, firms are more likely to borrow in order to invest because it reduces the cost of an investment and thereby increases potential returns. However, demand for loanable funds is not very sensitive to changes in interest. Far more important are the expectations firms have regarding future levels of AD. If firms are not optimistic about future levels of aggregate demand lower interest rates are unlikely to encourage them to borrow in order to invest.

**Model sentence:** Fiscal policy and monetary policy are called demand-side policies because their purpose is to change the components of aggregate demand.

**Structural unemployment**

Structural changes in the economy lead to occupational immobility. Demand for certain skills falls leading to a rise in unemployment. These workers are willing to work but do not possess the skills that industries now demand. Increasing AD will not affect this type of unemployment. The government could introduce policies that lead to an increase in the supply of labour that possess the skills that are in demand. Such policies are supply-side policies because the aim is to affect a factor of production that is used in order to supply goods and services.

Government can increase occupational flexibility through education and training. A good education in schools should give young people the necessary skills to be able to adapt to the demands of industry, enabling them to be able to learn new skills later in life. Post-16 and -18 colleges could offer courses that give students the necessary skills so that they can find jobs. In this way government directly intervenes by providing the training necessary skills so that they can find jobs. In this way government directly intervenes by providing the training
needed to correct market failure caused by occupational immobility. This type of training is funded by tax revenue. There is a large opportunity cost of direct provision meaning that there will be less investment in other areas such as transport infrastructure and health services. The government can encourage private firms to offer training and apprenticeships through the provision of subsidies. A subsidy reduces the private cost of providing training and apprenticeships thereby increasing their supply. Again there is an opportunity cost of this policy. The firms might use the subsidy for purposes other than training and therefore not always provide sufficient training. The government must use scarce resources in order to make sure that training takes place.

The government can reduce the cost of moving from one area to another in order to reduce geographical immobility. For example, governments can provide relatively cheap social housing in areas where rents are relatively high or reduce households’ tax rates. Increasing investment in transport infrastructure will reduce commuting times thereby making it possible for people to get to and from work efficiently without having to move house. The government could encourage firms to relocate to areas of high structural unemployment by, for example, reducing local business taxes and corporation tax.

Introduction of all these policies involves large opportunity costs. Less tax revenue is available for alternative investments. The policies are effective only in the long term. The supply of labour with the skills demanded by industry increases slowly over time. If the policies are to be effective government must also have accurate information about the type of skills not only needed now but those that will be needed by industry in the future.

**Real wage/classical unemployment**

Policies introduced to reduce the power of trade unions to negotiate with management a higher wage rate will reduce classical unemployment. The removal of the guaranteed minimum wage removes a barrier to wage flexibility. Such policies allow the wage rate to be flexible so that it can change in response to market forces. When there is excess supply of labour at the wage rate the wage then can fall until quantity of labour demanded and the quantity of labour supplied are equal and the market clears thereby curing classical unemployment.

The removal of the minimum wage would reduce the standard of living of low-paid workers making the distribution of income more unequal. The workers might be better off claiming unemployment benefits so they will leave the labour force entirely and perhaps start working in the hidden economy. This would reduce the full employment level of output.

**Frictional unemployment**

If the government reduced unemployment benefit it would act as an incentive for those between jobs to seek and take jobs more quickly. Government could improve the lines of communication between firms who demand labour and people who want to supply their labour by providing information about job vacancies through work agencies. School leavers and graduates who are looking for work are included in frictional unemployment statistics. Schools and universities could be instructed by government to provide career advice and information about job vacancies.

**What is the natural rate of unemployment?**

There is always some unemployment in a country even when the economy is producing at full employment levels of output. There will always be some people who are between jobs, those who are unemployed because demand for labour in some industries changes throughout the year or who are occupationally immobile. It is expected and even beneficial to the economy that workers will change jobs and that school leavers and graduates take time to find work. It is assumed that certain workers will be unemployed at certain times of the year due to a fall in demand for the output of certain industries. A developing and growing economy will go through structural changes so occupational immobility is a natural consequence of these changes and some occupational unemployment is in some ways a good thing because it is an inevitable result of economic growth.

**Model sentence:** Natural unemployment is the sum of frictional, seasonal, and structural unemployment. This sum expressed as a percentage of the labour force is the natural rate of unemployment.

**Test your understanding of this unit by answering the following questions**

- Distinguish between demand-deficient unemployment and structural unemployment.
- Discuss government policies to deal with demand-deficient unemployment.
- Discuss government policies to deal with structural unemployment.
- Explain the term ‘the natural rate of unemployment’.
Learning Outcomes

- Distinguish between inflation, disinflation, and deflation.
- Explain that inflation and deflation are typically measured by calculating a consumer price index (CPI), which measures the change in prices of a basket of goods and services consumed by the average household.
- Construct a weighted price index, using a set of data provided. (HL)
- Calculate the inflation rate from a set of data. (HL)
- Explain that different income earners may experience a different rate of inflation when their pattern of consumption is not accurately reflected by the CPI.
- Explain that inflation figures may not accurately reflect changes in consumption patterns and the quality of the products purchased.
- Explain that economists measure a core/underlying rate of inflation to eliminate the effect of sudden swings in the prices of food and oil, for example.
- Explain that a producer price index measuring changes in the prices of factors of production may be useful in predicting future inflation.

Explain the difference between inflation, disinflation, and deflation

Low and stable levels of inflation is a macroeconomic policy objective of government. Inflation is defined as a continuing or sustained increase in the average price level of goods and services in an economy over a given period of time. Deflation is a continuing fall in the average price level over a given period of time. A single increase or decrease in the price of a particular good is not inflation or deflation. During a year, the price of some goods and services increase while the price of others decrease. For example, the price of energy may increase and the price of clothes may decrease. Inflation or deflation is an increase or decrease in the average price level of goods and services. The rate of inflation is the rate at which prices increase over time. Disinflation is a fall in the rate of inflation. In other words, the average price level continues to increase but at a diminishing rate. Creeping inflation occurs when there is a relatively small increase in the average price level each year. Hyper-inflation occurs when there are sustained, very large increases in the average price level.

**Model sentence:** Inflation is a sustained increase in the average price level, deflation is a fall in the average price level, and disinflation is a fall in the rate of inflation.

Explain how inflation is measured

Inflation is a sustained increase in the average price level of goods and services. An index is used to measure the price level. If at the beginning of the year the price index was 100 and by the end of the year it rose to 104 this means that the rate of inflation was 4%. The consumer price index (CPI) is used by many governments to measure the changes in the price level of consumer goods and services. Prices of a large selection of goods and services (called the ‘basket’ of goods) are monitored by the government each month. Goods and services in this ‘basket’ include food and drinks, gas and electricity, rent, car insurance, clothes, electrical goods, mobile phones, petrol, train and bus fares, along with many others. Prices of some goods in the basket increase and some fall but when the price of the basket of goods shows an overall increase it means that there has been an increase in the average price level. Prices are taken from a number of suppliers and retailers across different regions of a country and an average of the change in price of each good is calculated and then converted into a price index.

The contents of the basket of goods changes over time. For example, a change in technology leads to changes in the consumption of goods. Now many people buy laptop computers and buy music by downloading it. These items are now included in the basket of goods. The goods selected to be in the basket changes with patterns of consumer consumption so that it is representative of the goods consumed by the average household. This means that the calculated inflation rate is one that is experienced by the average household.

**Model sentence:** When calculating the rate of inflation the base period is a specific point in time that is chosen by the government in order to be able to measure changes in the price of a basket of goods from the chosen point in time to a later point in time.
Calculate the CPI – a step-by-step guide

Trouble shooter

The government wanted to calculate the change in prices between 1 January and 31 December. The base period index is calculated using the following formula:

\[ \text{CPI on 31 December} = \frac{\text{the price of the basket of goods on 31 December}}{\text{the price of the basket of goods on 1 January}} \times 100 \]

The price of the basket of goods on 1 January divided by itself equals 1 and then multiplied by 100 = 100. The consumer price index for the base period of time is always 100.

The consumer price index for 31 December is calculated by using the formula:

\[ \text{CPI on 31 December} = \frac{\text{the price of the basket of goods on 31 December}}{\text{the price of the basket of goods on 1 January}} \times 100 \]

The sum of the prices of the goods in the basket on 1 January was $20,000.

If an average household spent $10,000 on goods and services at the beginning of the year, it would have to pay $10,250 for the same goods and services at the end of the year.

This method of calculating the rate of inflation is oversimplified and not very useful because it does not take into account the proportion of income spent by the average household on each type of good. Each good is assumed to be equally as important. But the purchasing power of an average household’s income is affected more by changes in the price of petrol and rents than it is by changes in the price of a box of matches and the price of chocolate.

Construct a weighted price index, using a set of data provided, and calculate the rate of inflation (HL)

An average household spends a higher proportion of its disposable income on some goods than it does on others. For example, the average household might spend 30.8% of its disposable income on housing, 16.2% on food and non-alcoholic drinks, 15.5% on transport, and 13.5% on recreation and leisure, spending a much lower proportion on tobacco, alcohol, and education.

Model sentence: The government puts the goods and services included in the basket of goods into categories and calculates the proportion of the average household’s income that it spends on each category.

Using this data the government gives a weight to each category. For example, the category of food and non-alcoholic drinks includes lots of items such as bread, butter, beef, potatoes, peas, milk, tea, coffee, as well as ready-prepared meals. The transport category includes petrol, new cars, bus fares, train fares, car insurance, and so on. The weight each category is given is a reflection of the proportion of income that the average household spends on the goods and services in each category. The sum of the weights given to each category equals 100. Shown in Table 52.1 is an example of the weighted categories for a country.

Also shown is the change in price in each category. The price of the goods and services included in the housing category has increased by an average of 5%. To calculate a 5% increase in the proportion of income spent on housing multiply 30.8 by 1.05: 30.8 \times 1.05 = 32.34. The average price of goods in the health category has increased by an average of 10%. To calculate the 10% increase in the proportion of income spent on health, multiply 2.1 by 1.1: 2.1 \times 1.1 = 2.31. The same is done for all categories and appear in the final column and are added to give the total.
### Table 52.1

The consumer price index can be used to calculate the rate of inflation (IR) between two periods of time by using the following formula:

\[
	ext{IR} = \left( \frac{\text{CPI time period 2} - \text{CPI base index}}{\text{CPI time period 1}} \right) \times 100
\]

Using the example in Table 52.1, IR = \( \frac{(104.532 - 100)}{100} \times 100 = 4.532\% \)

If the CPI increases from 104.532 to 106.6 in the following year, the inflation rate over the two-year period is calculated in the following way:

\[
\text{IR} = \left( \frac{\text{CPI time period 3} - \text{CPI time period 1}}{\text{CPI time period 1}} \right) \times 100 = \left( \frac{106.6 - 100}{100} \right) \times 100 = 6.6\%
\]

The rate of inflation between period 2 and 3 is calculated in the following way:

\[
\text{IR} = \left( \frac{\text{CPI time period 3} - \text{CPI time period 2}}{\text{CPI time period 2}} \right) \times 100 = \left( \frac{106.6 - 104.532}{104.532} \right) \times 100 = 1.98\%
\]

In Table 52.1, housing prices increased by 5% while the price of clothing did not change. In Table 52.2, the price of housing remains unchanged while the price of clothing increases by 5%. The calculations are done as before and are shown in the table.

### Table 52.2

The index has risen from 100 to 102.992: IR = \( \frac{102.992 - 100}{100} \times 100 = 2.992\% \)

A percentage change in the price of housing has a greater effect on the overall rate of inflation than the same percentage change in the price of clothing.
The rate of inflation over the year was just under 3%, compared with over 4% in the previous example. This highlights the importance of weighting the various categories. The rate of inflation is affected more by changes in the price of goods that the average consumer spends a relatively higher proportion of their income on and is affected least by changes in the price of goods that the average consumer spends a relatively lower proportion of their income on.

**Model sentence:** The proportion of income spent by each household on the categories of goods is different, therefore each household has a different rate of inflation.

---

### Explain the limitations of the consumer price index as a measure of inflation

The CPI measures changes in the average price of goods and services that are bought by a typical household over a given period of time. The idea is that the rate of inflation should give a true reflection of how price changes affect most people living in a country. Households buy different baskets of goods and in varying proportions. A household on low income spends a higher than average proportion of its disposable income on food, rent, and other necessities, and a much lower proportion of income on luxuries such as holidays abroad than a household earning relatively high income. Therefore, when the price of necessities increases, it has a much greater impact on the standard of living of those on low incomes than it does on households earning a much higher income. The inflation rate for the low income household in this example is higher than the CPI average rate of inflation because very low income earners spend nearly all their income on necessities.

Price increases are sometimes caused by advances in technology and these are not taken into account when calculating the rate of inflation. The quality and efficiency of washing machines and computers for example has improved a lot over the years and these advances can lead to an increase in price but the new goods are in some ways not comparable with the older, less technologically advanced goods.

Patterns of consumption can change relatively quickly and the government must change the basket of goods so that it represents the purchasing habits of the average household. It takes a relatively long period of time to make the necessary changes to the basket of goods; therefore, at any one time the goods in the basket are not an accurate representation of the quantity and types of goods currently consumed. Therefore, the average rate of inflation is inaccurate.

Inflation is defined as a sustained increase in prices. However, the statistics gathered by the government do not take into account short-term changes in price caused by changes in supply-side factors. Food prices can rise steeply at certain times of the year due to shortages but can fall again quite quickly once supply rises. Petrol price increases can also change quickly due to supply-side factors but over the long term the trend in price increases is more stable. Such increases in price can give a misleading inflation rate. Governments try to take into account the effects of these changes in price by calculating a ‘core’ inflation rate by excluding the goods from the basket of goods.

CPI measures changes in the price of consumer goods. The price of factors of production is not taken into account. A producer price index (PPI) measures a basket of goods made up of raw materials, capital, and energy. PPI is a useful measure because it shows what is happening to costs of production and therefore can be used to predict what will happen to the price of consumer goods in the future. If costs of production increase, firms increase prices of the goods they produce in order to maintain their profit margins. Inflation caused by increases in the price of factors of production is called cost-push inflation.

Errors occur in the collection of the data affecting the accuracy of the calculated rate of inflation. Also only a small percentage of retailers and suppliers are used to collect the data on price changes. The government could extend the number of retailers and suppliers and increase the number of areas of the country where data is collected, but this increases the resources needed and adds to the costs of data collection.

The basket of goods and the ways data is collected varies across countries. This makes international comparisons of rates of inflation both difficult and misleading.

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### Test your understanding of this unit by answering the following questions

- Distinguish between inflation, disinflation, and deflation.
- Explain the term ‘the basket of goods’.
- What are the limitations of CPI as a measure of inflation?
- What is the producer price index?
- Explain why individual households experience different rates of inflation.
- Answer the questions below by using the information in the table (HL).
2.3 Macroeconomic objectives: Low and stable rate of inflation

CPI date for country 1; Q3 = third quarter (i.e. July–September); Q4 = forth quarter (i.e. October–December) etc.

<table>
<thead>
<tr>
<th></th>
<th>Q3 2008</th>
<th>Q4 2008</th>
<th>Q1 2009</th>
<th>Q2 2009</th>
<th>Q3 2009</th>
<th>Q4 2009</th>
<th>Q1 2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>Country I's CPI</td>
<td>108.4</td>
<td>107.9</td>
<td>107.7</td>
<td>108.3</td>
<td>108.5</td>
<td>108.6</td>
<td>109.1</td>
</tr>
</tbody>
</table>

- Calculate Country I's inflation rates between each of the seven quarters.
- Between which quarters was the inflation rate highest? Lowest?
- Between which quarters did Country I experience disinflation?
- Between which quarters did Country I experience deflation?

Learning Outcomes

- Discuss the possible consequences of a high inflation rate, including greater uncertainty, redistributive effects, less saving, and the damage to export competitiveness.
- Discuss the possible consequences of deflation, including high levels of cyclical unemployment and bankruptcies.
- Explain, using a diagram, that demand-pull inflation is caused by changes in the determinants of aggregate demand (AD), resulting in an increase in AD.
- Explain, using a diagram, that cost-push inflation is caused by an increase in the costs of factors of production, resulting in a decrease in short-run aggregate supply (SRAS).
- Evaluate government policies to deal with the different types of inflation.

Explain the effect inflation has on the purchasing power of money

Inflation causes real incomes to fall. This occurs when the rate of inflation is greater than the rate at which income grows. Changes in real income are calculated by subtracting the percentage change in nominal income from the rate of inflation. If the rate of inflation is 5% and nominal income increases by 2%, then real income falls by 3%. Inflation causes the purchasing power of money to fall. The amount of goods and services that can be bought with a set nominal income falls. Consumers cannot satisfy as many wants with their income, therefore consumer welfare falls.

**Model sentence:** If the percentage increase in nominal income is equal to the rate of inflation, then real income stays the same, leaving the purchasing power of income unchanged.

Explain the effect of inflation on the incentive to save

Some households save a proportion of their disposable income in a savings account at a bank. In return for the use of the money the bank pays the saver interest on the amount of money saved. For example a saver puts $10,000 in the bank at an interest rate of 5% per annum (each year). The interest paid to the saver is 5% of $10,000 which equals $500. At the end of the year, the saver has $10,500 in the bank (less any tax that must be paid on the interest earned). The purchasing power of the savings has increased. However, if the rate of inflation is greater than the rate of interest then the purchasing power of the saved money falls. If inflation is 6% and the nominal rate of interest is 5%, the real value of the money saved falls by 1%. Fewer goods and services can be bought with the savings than could have been bought at the start of the year. If inflation is 3% and the nominal rate of interest is 5% then the real value of the savings increases not by 5%, the nominal rate of interest, but by only 2%. Therefore, in order to calculate the increase in the real value of the savings, inflation must be taken into account.

**Model sentence:** The real interest rate takes into account the effects of inflation on the purchasing power of the saved money. The real rate of interest = the nominal rate of interest – the rate of inflation.

It is important to say that the formulae used above are simplified versions of the formulae actually used by economists when working out real income and the real interest rate for government and other institutions.

When the rate of inflation is greater than the nominal rate of interest, the real rate of interest is negative. The savings could buy more goods at the start of the year than at the end. Households bring forward consumption...
returns on investment
expressed as a percentage it is calculated using the formula: return on investment = (gain from investment – cost of investment) / cost of investment × 100. It is used by firms to evaluate the effectiveness of an investment project and to compare the potential returns from investment options.

equilibrium price the price at which the quantity consumers are willing and able to buy is equal to the quantity firms are willing and able to produce.
nominal rate of return the amount of money earned on money invested, expressed as a percentage of the sum invested, not adjusted for inflation.
positive real return when the return on investment is positive after it has been adjusted to take into account the effect inflation has on its value.
long-run economic growth an increase in the productive capacity of a country.
productivity the quantity of output per unit of input.
full-employment level of output the potential quantity of output that can be produced in an economy when all factors of production are employed.
circular flow of income an economic model that shows the flow of money between households and firms and, in more complex versions, the flows of money into and out of the financial sector, government sector, and the international sector.
cyclical unemployment unemployment caused by a lack of aggregate demand. Unemployment changes as the economy goes through the business cycle, increasing when AD falls and decreasing when AD rises.
current account deficit occurs when the amount of money flowing out of a country from the trade in goods and services, investment income, and transfers is greater than the amount flowing in.

when high levels of inflation are expected because the money spent now can buy more goods and services than in the future. Inflation encourages consumption now and discourages saving. This could lead to a fall in the supply of loanable funds available for firms to borrow and therefore to a fall in investment. Investment is needed for the economy to grow.

When the real interest rate is low, households try to find ways of earning higher returns on investment. So instead of putting income into a savings account, a household might buy assets, such as gold, property, shares, and art instead. When real interest rates are low, often the price of gold increases. This is because demand for gold increases as households try to increase their returns on savings thereby pushing up the equilibrium price of gold.

Model sentence: Ceteris paribus, the higher the rate of inflation, the lower the real rate of interest. High inflation encourages households to bring consumption forward and low real rates of interest reduce households’ incentive to save.

Explain the redistributive effects of inflation
Inflation causes the real interest rate to fall causing a transfer of resources away from savers to borrowers. For savers, inflation leads to a fall in the real value of their savings but for borrowers, inflation reduces the real value of their debt. Inflation is bad for savers but benefits borrowers.

There are many people who live on a fixed income, such as income from a private pension or from a savings account. Many incomes from private pensions do not increase each year with inflation. The nominal income never increases. It is fixed. Inflation reduces the purchasing power of their income year by year but nominal income does not increase to offset the loss of real income caused by inflation. The standard of living of those on a low fixed income is affected more by inflation than those who work because workers occasionally receive increases in their nominal income.

Explain how inflation affects business certainty, economic growth, and employment
Unstable rates of high inflation lead to business uncertainty. Firms are uncertain about how much their costs of production will be and what the price of the good will be. This makes it difficult to assess potential returns on investment projects thereby reducing total investment in the economy. Firms want to earn a higher nominal rate of return on any investment to offset the effect of inflation. This means that less investment will take place because the risk of not making a positive real return increases when there are high rates of inflation. Investment is needed for long-run economic growth because increasing the quantity and productivity of capital leads to an increase in full-employment levels of output. Also investment is a component of aggregate demand (AD) and an injection into the circular flow of income. The initial investments cause further increases in expenditure and income. As AD increases, firms take on more workers in order to increase supply and cyclical unemployment falls. Therefore, as investment falls it will have a negative effect on employment.

Explain how inflation affects international competitiveness
If the rate of inflation is greater in Italy than in countries with which Italy trades, consumers in the other countries have to pay a higher price for Italian goods and the quantity demanded of Italian exports falls. Also Italians will buy fewer domestically produced goods as they switch expenditure away from the relatively more expensive Italian goods to the relatively lower priced imported goods. Expenditure on imports increases and expenditure on exports falls leading to an increase in an existing current account deficit. Relatively high rates of inflation lead to a fall in international price competitiveness.

Explain the causes and consequences of deflation
Deflation occurs when there is a sustained fall in the average price level. The purchasing power of money increases. As the average price level continues to fall, more and more goods and services can be bought with the same nominal income.
Deflation can be caused by falling aggregate demand. The negative output gap or the deflationary gap, which is the difference between actual output and full-employment level of output, gets bigger as AD falls. This is the difference between $Y_2$ and $Y_1$ as shown in Figure 53.1. Falling AD, from $AD_1$ to $AD_2$, leads to an excess of aggregate supply over aggregate demand and the average price level falls from $P_1$ to $P_2$ in order to eliminate it. Total expenditure in the economy is not sufficient to buy all the goods and services produced when all factors of production are employed. Firms lay off workers as they reduce output in response to falling demand and cyclical unemployment or demand-deficient unemployment rises. Remember that the demand for labour is a derived demand. It is derived from the demand for goods and services.

Deflation can also be caused by an increase in the full potential level of output. This occurs when there is an increase in the quantity and/or quality (productivity) of the factors of production. The full-employment level of output is at $Y_f$, as shown in Figure 53.2. After an increase in the quantity and/or quality of one or more of the factors of full-employment, the level of output increases and the long-run aggregate supply (LRAS) curve shifts to the right. Full-employment levels of output increases from $Y_f$ to $Y_f'$. This causes an excess of aggregate supply at price level $P$ and the average price level falls to $P$, in order to eliminate it. However, when firms invest in new capital, it increases aggregate demand. If AD increases at the same rate as LRAS, deflation will not occur. Deflation is much more likely to be caused by falls in AD.

![Figure 53.2](image)

As expenditure and prices fall, firms receive less producer revenue (price × quantity sold). Firms reduce output in response to falling consumption. Firms need fewer workers and reduce their labour force. Cyclical or demand-deficient unemployment increases and firms’ profits fall. As profits fall, some firms make a loss or negative profit. Firms can make losses in the short run. Firms will keep trading in the hope that demand for their output will increase in the future. But if losses continue to be made in the long run, firms will close down owing money to their suppliers.

Unemployment rises, therefore government expenditure on unemployment benefit increases while at the same time government revenue received from income tax falls. A growing deflationary gap might lead to an increase in the budget deficit as the difference between government revenue and government expenditure grows.

Consumers delay or hold back consumption of non-necessities if it is expected that prices will continue to fall. A household might delay the purchase of a new car or television set until prices have fallen even more. Aggregate demand continues to fall, increasing levels of unemployment and bankruptcy rates.

Consumer confidence is very important in determining levels of aggregate demand. If households believe that they might lose their jobs then they will reduce present expenditure. Deflation reduces the value of assets such as houses and gold. A fall in wealth leads to a fall in confidence, which leads to a fall in expenditure.

Deflation leads to an increase in the value of debt because debt repayments are made with money that is increasing in value. Deflation causes the value of household and business debt to rise. Household and business debt repayments are usually fixed. Repayments made by households and firms do not fall as prices fall, therefore the value of the debt rises. Deflation leads to a fall in producer revenue but debt repayments do not fall, thereby the burden of debt increases.

Households continue to make the repayments on the debt. Increasing debt reduces consumer confidence, which in turn reduces expenditure. Deflation increases the real value of business debt. Business loans must be paid back at a time when profits are falling, leading to more bankruptcies. As aggregate demand, revenues, and profits fall firms lack the confidence to invest. Therefore, investment, a component of AD, falls.

### Explain the causes of demand-pull inflation

**Demand-pull inflation** is caused by an excess of aggregate demand over aggregate supply. AD = consumer expenditure on domestically produced goods (C) + investment by firms (I) + government expenditure (G) + (expenditure on exports (X) – expenditure on imports (M)). For example, an increase in AD might be caused by growing confidence in the economy. Consumer expenditure (C) increases and firms respond to higher levels of consumption by increasing investment (I) and the AD curve shifts up and to the right as shown in Figure 53.3. The increase in AD can be caused by an increase in one or more of the components of AD.

Increasing levels of AD ‘pull-up’ prices in the economy. Aggregate demand (total expenditure) begins to exceed aggregate supply (total output). Firms increase supply in response to increases in consumption but when...
Subject vocabulary

cost-push inflation inflation caused by an increase in the costs of production, resulting in a decrease in aggregate supply

profit margin the percentage of producer revenue that ends up as profit for the firm. Profit margin = profit/producer revenue × 100. If a firm earns a profit of $20m from sales of $80m its profit margin is 25%.

factors of production the inputs into the production process (land, labour, capital and entrepreneurship)

supply-side shocks occurs when there is an unexpected change in the supply of a good resulting in a sudden change in its price

corporation tax a tax levied in the UK on company profits

minimum wage the minimum amount of money a firm is legally allowed to pay a worker for one hour's work

monetary policy the control of the supply of money by the central bank to affect the economy (e.g. changing interest rates)

fiscal policy government policy designed to achieve macroeconomic objectives through government expenditure and taxation

demand-side policies policies that are designed to influence aggregate demand

contractionary monetary policy policy involving the reduction of the money supply and the increase of interest rates

deflationary monetary policy a policy designed to eliminate an infl ationary gap through reducing the money supply and increasing interest rates

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**Model sentence:** When AD rises at a faster rate than AS, the price level rises to eliminate the excess AD.

---

Explain the causes of cost-push inflation

*Model sentence:* Cost-push inflation occurs when the costs of production increase, causing firms to increase price in order to maintain profit margins.

Cost-push inflation often occurs in a boom phase of the business cycle when demand for the factors of production is high. Increasing demand for raw materials or labour, for example, leads to an increase in their price, thereby causing an increase in the costs of production. Inflation is also caused by supply-side shocks. For example, when the price of oil in the early 1970s went up very quickly, the costs of production for industries all over the world went up, leading to cost-push inflation.

If the country’s currency depreciates in value relative to other currencies, the price of all imported goods, including raw materials rises. This is called imported inflation. Firms have to pay a higher price for imported raw materials, leading to an increase in the costs of production and in turn to cost-push inflation.

Governments can cause inflation. An increase in corporation tax reduces company profits. Firms may increase the price of their goods. An increase in the minimum wage causes an increase in the costs of production and firms may increase the price of their goods in order to maintain profit margins.

This is shown in Figure 53.4 as a shift up and to the left of the short-run aggregate supply curve from SRAS₁ to SRAS₂. The average price level rises, causing aggregate demand to fall. Real output falls from Y₁ to Y₂, leading to a rise in unemployment.

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Explain how an increase in interest rates reduces aggregate demand

Governments use both monetary policy and fiscal policy to control inflation. These policies are demand-side policies because the aim of the policies is to change the level of aggregate demand. Monetary policy is concerned with controlling the money supply in the economy and this is usually achieved by changing interest rates. Contractionary monetary policy or deflationary monetary policy is introduced by government to reduce the supply of money and thereby reduce spending in an economy. The main way the supply of money is reduced is by increasing interest rates.

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**Model sentence:** Increases in the cost of production cause both inflation and demand-deficient unemployment.
2.3 Macroeconomic objectives: Low and stable rate of inflation

Although in most countries the setting of interest rates is controlled by the central banks and not governments, the main objective of most central banks is to keep inflation low and stable, and they try to achieve this by managing interest rates.

Fiscal policy is concerned with government expenditure and government tax revenue. A contractionary or deflationary fiscal policy aims to reduce AD by reducing expenditure and increasing taxes. If inflation is caused by excess aggregate demand (demand-pull) then reducing expenditure in the economy should reduce the rate of inflation.

(Recall: \( AD = C + I + G + (X-M) \))

Government or central banks increase the interest rate in order to reduce inflationary pressures caused by high levels of expenditure. Households borrow money from banks in order to bring forward consumption of relatively higher priced durables such as TVs, washing machines, carpets, and cars. Increasing the interest rate increases the cost of borrowing and in effect increases the price the consumer pays for the good. As the cost of borrowing rises, expenditure (C) on these items falls, therefore AD falls.

Higher interest rates mean higher interest payments on existing loans. Households with mortgages must pay more each month in interest payments on the loan thereby reducing discretionary income and in turn household expenditure (C). Some firms are highly geared. This means much of their investments have been financed by borrowing. Higher interest rates lead to higher interest payments on the loans and a fall in profit leaving firms with less profit to invest so investment (I) falls.

As interest rates rise, the cost of investment projects increase because interest payments on the loan increase. Ceteris paribus, as interest rates rise profit made on each investment falls therefore firms are less likely to make the investment. Higher interest rates lead to a fall in investment (I) therefore AD falls. As interest rates on savings accounts increase the minimum opportunity cost of any investment increases. Instead of investing in productive capacity, which comes with a relatively high risk, the firm may simply choose to place the money in a savings account and earn the interest payments at zero risk.

**Model sentence:** As interest rates rise the cost of borrowing increases reducing expenditure that is financed through loans.

Relatively high interest rates attract financial capital from abroad from individuals and financial institutions looking for higher returns on their money. Demand for the currency rises and it appreciates against other currencies. As the price of the currency rises, the price foreigners pay for the country’s exports increases leading to a fall in quantity demanded of exports (X), therefore AD falls.

A high rate of interest leads to an increase in saving. More of households’ disposable income is saved. If income is saved, it cannot be spent on goods and services.

**Model sentence:** Ceteris paribus, as interest rates rise the incentive to save increases. The more income that is saved by households, the less is spent. Therefore, as the interest rate rises, AD falls.

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**Subject vocabulary**
- **mortgages** loans that are secured against property
- **discretionary income** income after tax and expenditure on basic necessities such as rent, heating, and food
- **highly geared** a company that has a large amount of debt in proportion to the value of the shares issued
- **productive capacity** the maximum possible output of a firm, industry, or an economy
- **financial capital** the money used by firms and entrepreneurs to purchase the resources needed to produce goods or services
- **financial institution** a business, such as a bank, that provides a service allowing firms and households to make deposits and take out loans and to make investments
- **disposable income** household income after direct taxation has been deducted
- **merit good** a good/service that the government believes will be under consumed left to the free market. Consumption of a merit good may generate positive externalities therefore the social benefit of consumption is greater than the private benefit. Individuals do not take into account the positive externalities when deciding the amount to consume therefore the good is underprovided and under consumed.
- **government’s borrowing requirement** the amount of money a government needs to borrow in order to offset its budget deficit
- **balanced budget** occurs when the tax revenue received by a government is equal to government expenditure

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**Explain how a fall in government expenditure and increases in taxes reduces aggregate demand.**

Keynesians argue that the government should manage aggregate demand in order to achieve its macroeconomic objective of low and stable inflation. Taxes can be increased and government expenditure (G) reduced to reduce excess aggregate demand and bring the average price level down.

If the government increases income tax disposable incomes fall, leading to a fall in household expenditure on domestically produced goods (C). An increase in corporation tax reduces the incentive for firms to invest as less profit from each investment is made. Also after-tax profits fall leaving less profit available for investment (I), therefore AD falls. Government can reduce government expenditure (G) by spending less on merit goods and public goods and by reducing benefit payments, thereby reducing AD. Cuts in government expenditure and increases in tax lead to a fall in the government’s borrowing requirement and the government might be able to achieve a balanced budget, where government expenditure equals tax revenue.

**Model sentence:** As tax rates increase, household disposable income and company profits fall, leading to a fall in household expenditure and business investment.

As aggregate demand falls, firms respond by reducing output. Therefore, demand for the factors of production fall leading to a fall in factor prices. This lowers the costs of production, thereby reducing inflationary cost-push pressures.
Governments can affect the inflation rate directly by controlling wages and prices in the public sector. If the state owns industries and services, it employs lots of workers such as nurses, teachers, railway workers, bus drivers, and post office workers. The government can minimize wage increases in the public sector. Reducing the real wage of the public sector workers reduces government expenditure and may persuade those in the private sector to accept cuts in their real wage. The government could minimize price increases of goods and services produced by state-owned industries. However, profits will fall and any losses must be subsidized by the taxpayer. The influence a government has is dependent on the number of industries under state control. The government can reduce indirect tax on goods, thereby reducing costs of production, for example, by reducing duty on petrol.

**Glossary**

**trade-off** a situation that involves giving up something in return for gaining another thing

**subject vocabulary**

**public sector** the part of an economy that is controlled by the state. It concerns the provision of government services including national defence, education, and health.

**private sector** the part of the economy that is regulated but not controlled by the state and concerns individuals and groups bringing together the factors of production normally with the aim of making a profit.

**supply-side policies** government policy designed to affect the level of aggregate supply in an economy by increasing the quantity and/or productivity of the factors of production.

**productivity** the quantity of output per unit of input.

**state monopolies** state-owned sole suppliers of goods and services.

**entrepreneur** an individual who, in pursuit of profit, brings together the other factors of production in order to produce a good or service.

**international trade** the cross-border exchange of goods and services.

**tariffs** a tax placed on imported goods and services.

**quota** a physical limit placed on the number of goods that can be traded or produced.

**open economy** an economy in which firms engage in the international exchange of goods and services.

**external supply-side shock** occurs when there is an unexpected change in the supply of a good produced abroad that results in a sudden change in its price.

**Evaluate government policies to deal with the different types of inflation**

In the short run, government can try to keep inflation low and stable by managing aggregate demand through fiscal and monetary policy. The aim is to keep aggregate demand at a level that is enough to buy full- or nearly full-employment levels of output. When aggregate demand exceeds aggregate supply, causing demand-pull inflation, governments introduce expansionary policies to reduce aggregate demand and bring down the price level. Lowering aggregate demand reduces demand for the factors of production, including labour, lowering factor prices, and thereby reducing cost-push inflationary pressures. However, the fall in demand for labour leads to higher levels of demand-deficient unemployment. There is a trade-off between inflation and unemployment. Government tax revenue falls and government expenditure rises as benefit payments increase. This can cause a budget deficit and the government must borrow from the financial markets, thereby increasing the national debt.

Trade is becoming more globalized. Most countries have open economies. Inflation in one country can be caused by what happens in other countries. Controlling inflation by managing aggregate demand will not be successful if cost-push inflation is caused by external supply-side shocks, such as oil price increases caused by disruption of the world supply of oil.

Deflationary fiscal and monetary policies are unpopular with households and firms because higher taxes and interest rates reduce company profits and household income. Politicians do not want to upset the voters before an election for fear of losing votes.

Governments are not able to change fiscal policy quickly. There is a long legislative process that must be gone through before a deflationary fiscal policy can be introduced and after such a policy is introduced it takes time for households to change their patterns of consumption in response to a fall in disposable income. Therefore, it is not possible for government to use fiscal policy to quickly affect levels of aggregate demand. Governments find it very difficult to make real cuts in government expenditure. They have many commitments, such as the provision of state pensions, transport infrastructure, health services, and other merit and public goods. With growing demands and expectations, it is very difficult for governments to make cuts in public spending. Because of the limitations of fiscal policy, governments tend to favour the use of interest rates to manage levels of aggregate demand.

Relatively high taxes and interest rates discourage investment and entrepreneurship. The less income people keep for themselves, the less likely they are to risk their time and money starting a new business and there is less incentive for firms to make investments. The higher the cost of borrowing, the lower the return on any investment funded through borrowed money; therefore, the less likely firms are to borrow to invest.

Deflationary policy therefore has a negative impact on the future potential levels of output of an economy. It is easier for a government to control inflation if the potential output of the economy is steadily growing. As stated...
2.3 Macroeconomic objectives: Low and stable rate of inflation

before, this is achieved through supply-side policies aimed at increasing labour mobility, market competitiveness, innovation, and productivity. Aggregate demand can steadily increase without demand-pull and cost-push inflationary pressures building up.

A summary of the main points

Fiscal and monetary policies are used to reduce AD, thereby reducing demand-pull and cost-push inflation. However, doing so can cause unemployment, leading to a budget deficit and an increase in the national debt. Importation cannot be controlled by reducing AD.

Tax increases are unpopular so politicians may not be prepared to introduce this policy through fear of not being re-elected.

There is a long time lag between an increase in tax and changes in aggregate demand.

Governments have spending commitments so it is very difficult to make real cuts in expenditure that will reduce aggregate demand.

Higher rates of tax discourage investment by firms and entrepreneurial activity leading to a reduction in long-run economic growth.

Fiscal policy has many disadvantages; therefore, some governments prefer to use interest rates as a method of controlling inflation and use supply-side policies to increase productivity and LRAS, thereby reducing demand-pull inflationary pressures.

Test your understanding of this unit by answering the following questions

- Using diagrams, distinguish between demand-pull and cost-push inflation.
- Explain the consequences of deflation.
- Discuss the effectiveness of deflationary demand-side policies as a cure for inflation.

Learning Outcomes

- Discuss, using a short-run Phillips curve diagram, the view that there is a possible trade-off between the unemployment rate and the inflation rate in the short run.
- Explain, using a diagram, that the short-run Phillips curve may shift outwards, resulting in stagflation (caused by a decrease in SRAS due to factors including supply shocks).
- Discuss, using a diagram, the view that there is a long-run Phillips curve that is vertical at the natural rate of unemployment and therefore there is no trade-off between the unemployment rate and the inflation rate in the long run.
- Explain that the natural rate of unemployment is the rate of unemployment that exists when the economy is producing at the full-employment level of output.

Discuss the possible trade-off between the unemployment rate and the inflation rate in the short run

The trade-off between inflation and unemployment is based on the assumption that there is a negative causal relationship between money wages and levels of unemployment.

When aggregate demand (AD) increases from a very low level, firms increase their demand for labour but, because there is a relatively large supply of unemployed workers and because demand for workers is still relatively low, money wages do not increase. As AD continues to increase and the economy moves towards a boom and full-employment levels of output, the supply of unemployed workers falls. Firms must compete with each other to employ the falling number of unemployed workers thereby pushing up money wages. Also firms offer higher wages to attract workers already employed by other firms. So as unemployment falls, money wages increase. When the business cycle moves back towards a recession, with falling levels of AD, firms reduce output and lay off workers. Unemployment grows and workers might accept lower money wages to retain their jobs.

Subject vocabulary

- inflation: an increase in the general level of prices of goods/services in an economy over a given time period, usually a year.
- unemployment: occurs when there are people actively looking for work at the equilibrium wage rate but are not able to find work.
- negative causal relationship: a change in the value of one variable causes the value of the other variable to change in the opposite direction. For example, an increase in price causes a fall in quantity demanded.
- wage: payment to labour.
- aggregate demand: the total demand for goods and services in the economy at a given price level in a given period of time.

Glossary

- lay off (workers): temporarily end workers’ employment due to a lack of work.
Subject vocabulary

- costs of production: the amount the firm pays for the factors of production used to produce goods or services
- cost-push inflation: inflation caused by an increase in the costs of production, resulting in a decrease in aggregate supply
- full-employment level of output: the potential quantity of output that can be produced in an economy when all factors of production are employed
- Phillips curve: a graphic representation of the inverse relationship between unemployment and inflation
- stagflation: occurs when an economy experiences a period of increasing inflation, negative or zero economic growth, and rising unemployment
- demand-deficient unemployment: unemployment caused by a lack of aggregate demand
- short-run aggregate supply (SRAS): shows the amount of total output firms are willing to produce and sell in an economy at each price level in a given period of time when factor productivity and factor prices are held constant
- price level: the current weighted average price of a selected group of goods and services produced in a country over a period of time

Wages are a *cost of production*. Changes in costs of production affect the rate of inflation. When demand for labour falls, wages fall, leading to a fall in the cost of production. A fall in the cost of production leads to a fall in the rate of inflation. As AD increases, firms increase output and to do so demand more workers. Wages increase leading to an increase in the cost of production. Increased costs lead to *cost-push inflation*. As shown in Figure 54.2, as the economy moves towards full-employment levels of output, unemployment rates fall from 5% to 3% and the rate of inflation increases from 2% to 6%.

**Figure 54.2**

The **Phillips curve**, named after Bill Phillips, an economist who in the 1950s researched the relationship between money wages and unemployment, shows the trade-off between the rate of inflation and the rate of unemployment.

**Model sentence**: As AD rises, firms increase their demand for labour in order to increase output; therefore, unemployment falls. But increases in AD lead to demand-pull and cost-push inflation. There is a trade-off between unemployment and inflation.

In the 1970s many countries experienced long periods of stagflation. **Stagflation** occurs when inflation is high but aggregate demand is ‘stagnant’ (low for a long period of time). There was no trade-off between unemployment and inflation. Countries had at the same time high levels of demand-deficient unemployment and high levels of inflation. This is not what the theory says should happen. The theory was criticized by many economists because there was no trade-off between unemployment and inflation happening in the real world.

**Explain, using a diagram, that the short-run Phillips curve may shift outwards, resulting in stagflation**

Supply-side shocks cause stagflation. For example, when the price of oil rose quickly during the early 1970s, costs of production for firms around the world increased quickly, leading to cost-push inflation.

**Figure 54.3**

An increase in the cost of production leads to a shift up and to the left of the short-run aggregate supply curve from SRAS to SRAS*, as shown in Figure 54.3. This causes a rise in the average price level from P to P*, and a fall in output from Y* to Y. As firms reduce output, they lay off workers therefore unemployment increases. The country has at the same time rising prices and rising unemployment. At each rate of inflation the rate of unemployment is now higher. To show this new relationship between inflation and unemployment the Phillips curve shifts out to the right. Before the supply-side shock at the long-run equilibrium full-employment the economy is at point A on the Phillips curve. After the supply-side shock both the rate of unemployment and the rate of inflation are higher at point B. Stagflation can be caused by any changes in the economy that lead to a rise in the costs of production such as increases in taxes on businesses and increases in the price of factors of production. Increases in the cost of production cause cost-push inflation and the SRAS curve shifts up and to the left. Firms lay off workers as they reduce output leading to an increase in unemployment and the price level and the Phillips curve shifts up and to the right.
2.3 Macroeconomic objectives: Low and stable rate of inflation

Model sentence: A supply-side shock causes an increase in the cost of production leading to cost-push inflation. Short-run aggregate supply falls causing an increase in the price level which leads to a fall in expenditure. Firms lay off workers to reduce supply and unemployment rises.

Discuss, using a diagram, the view that there is no trade-off between unemployment and inflation in the long run

New classical economists believe that the economy will always move towards the long-run macroeconomic equilibrium at full-employment levels of output.

For example, an increase in AD leads to an increase in the demand for labour causing excess demand for labour in the labour market. Therefore, the wage rate rises to remove the excess demand. An increase in wages leads to an increase in the costs of production. Believers in the new classical model argue that, if there is no intervention in the labour market and wage rates are perfectly flexible, wages will rise immediately when demand for labour increases. Therefore, costs of production immediately increase. In Figure 54.3 the AD curve shifts up and to the right. The short-run macroeconomic equilibrium level of output, \( P_2, Y_2 \), which is greater than the full-employment level of output, exists only for a very short period of time. Wages increase leading to an increase in the costs of production and a shift up and to the right of the SRAS curve, from SRAS\(_1\) to SRAS\(_2\).

In Figure 54.4 at point A the rate of inflation is 2% and the rate of unemployment is 6%. The economy is at the long-run equilibrium level of output. Therefore, there is no demand-deficient unemployment. Unemployment is made up from frictional unemployment and structural unemployment. Together they make up natural unemployment. Therefore at point A the natural rate of unemployment is 6%. If the government, for example, introduced an expansionary fiscal policy to reduce unemployment below 6%, the increase in AD would lead to demand-pull inflation and cost-push inflation. At the same time there is an increase in the demand for labour as firms increase output. The increase in the competition for labour pushes wages up.

Subject vocabulary

- **long-run macroeconomic equilibrium** occurs when total expenditure is sufficient to buy the potential output in a given period of time. It is represented by the intersection of the AD and LRAS curves.
- **excess demand** occurs when quantity demanded is greater than quantity supplied
- **short-run macroeconomic equilibrium** occurs where aggregate demand is equal to short-run aggregate supply
- **money illusion** the idea that people consider the nominal value of money rather than its real value thus ignoring the purchasing power of their income. People therefore have an unrealistic picture of their income and wealth.
- **frictional unemployment** occurs when people move from one job to another and when people leave voluntary unemployment to look for work
- **structural unemployment** unemployment caused by a change in the type of labour firms demand. It is caused by a mismatch of the skills of those unemployed and the skills needed by firms.
- **natural unemployment** the combination of frictional and structural unemployment a certain amount of which always occurs in an economy. Therefore natural unemployment exists when an economy is producing at full-employment levels of output.
- **expansionary fiscal policy** policy involving the increase of government spending and/or the reduction of taxation
- **demand-pull inflation** occurs when aggregate demand is greater than aggregate supply
- **voluntary unemployment** occurs when people choose not to work at the equilibrium wage.

Figure 54.4

As the price level rises, total expenditure falls and there is a movement up and along the AD curve AD\(_2\). The economy automatically returns to the long-run equilibrium, P\(_3\), Y\(_f\), at the full-employment level of output. The only changes brought about by the increase in aggregate demand from AD\(_1\) to AD\(_2\) are an increase in wages and an increase in the price level from P\(_1\) to P\(_3\). Employment increases above full-employment levels but only in the short run, quickly returning to the long-run equilibrium level. So new classical economists argue that there is no trade-off between inflation and unemployment.

Workers that get a wage increase may believe that they are now able to buy more goods and services and are therefore better off. However, inflation reduces the real value of the wage. If inflation rises at the same rate as wages the workers are in fact no better off. Real wage does not change. Workers who believe they are better off after an increase in the money wage but in fact are not because of the effect inflation has on the real wage are experiencing money illusion.

Figure 54.5

At the higher money wage, the rate of voluntary unemployment falls. Some people, who before the wage increase did not want to supply their labour, will now enter the labour market because of the increase in wages. Unemployment in the short run falls from 6% to 3%. The rise in inflation and the fall in unemployment caused...
Subject vocabulary

demand-side policies policies that are designed to influence aggregate demand

occupational immobility occurs when workers do not have the necessary skills to change jobs.

demand-side policies policies that are designed to influence aggregate demand

generally immobile describes workers who are unable to relocate in order to find work, often because of the high costs of moving.

natural rate of unemployment the rate of unemployment at which inflation stabilises. At the natural rate of unemployment, all who want to work at the market wage can find work there is no involuntary unemployment.

long-run Phillips curve a vertical line at the natural rate of unemployment showing that in the long-run there is no relationship between unemployment and inflation.

non-accelerating inflation rate of unemployment the rate of unemployment that occurs in an economy without causing a change in the rate of inflation. If unemployment increases above this level the rate of inflation falls if unemployment falls inflation increases.

Model sentence: At the non-accelerating rate of unemployment the rate of inflation is constant because the demand for labour is not changing and therefore wages are stable. When the demand for labour rises because of increases in AD, wages are pushed up leading to cost-push inflation.

Test your understanding of this unit by answering the following questions

- Discuss, using a short-run Phillips curve diagram, the view that there is a possible trade-off between the unemployment rate and the inflation rate in the short run.
- Explain, using a diagram, the possible causes of stagflation.
- Discuss, using a diagram, the view that there is no trade-off between the unemployment rate and the inflation rate in the long run.
Learning Outcomes

- Define economic growth as an increase in real GDP.
- Describe, using a production possibilities curve (PPC) diagram, economic growth as an increase in actual output resulting from factors such as the utilization of unemployed resources and increases in productive efficiency, leading to a movement of a point inside the PPC to a point closer to the PPC.
- Describe, using a PPC diagram, economic growth as an increase in production possibilities caused by factors including increases in the quantity and quality of resources, leading to outward PPC shifts.
- Describe, using an LRAS diagram, economic growth as an increase in potential output caused by factors including increases in the quantity and quality of resources, leading to a rightward shift of the LRAS curve.
- Evaluate the view that increased investment is essential to achieve economic growth.
- Evaluate the view that improved productivity is essential to achieve economic growth.
- Discuss the possible consequences of economic growth, including the possible impacts on living standards, unemployment, inflation, the distribution of income, the current account of the balance of payments, and sustainability.

What is economic growth?

Economic growth is a macroeconomic objective of most governments. The three ways in which economic growth can be measured and the distinction between nominal GDP and real GDP are discussed in detail in Section 2.1 – The level of economic activity.

There are three ways to calculate GDP. The output method is the monetary value added to the inputs in the production process by all firms in the economy. The cost of the resources used in the production are subtracted from the sales revenue (price × quantity sold) in order to calculate the monetary value added by the firm. This means that the resources are not double counted. The income method is the sum of all payments made by firms to households for the use of the factors of production. It is the sum of wages, rent, profit, and interest. The expenditure method is the monetary value of total spending on goods and services in a given year.

Calculation of GDP is achieved through the addition of the price of all final goods produced in a country in a given year. GDP that measures the value of output in current prices is called nominal GDP. Increases in GDP year on year can occur because prices have increased. In other words, increases in GDP can occur because of inflation rather than an increase in economic performance. Nominal GDP will overstate any increase in the value of output. To calculate the real value of the output from one time period to another, the effects of inflation on the value of GDP must be taken into account. Nominal GDP is adjusted to take into account the effects of inflation on the value of output in order to value output at constant prices. Real GDP = nominal GDP adjusted for inflation.

**Model sentence:** Economic growth is an increase in the monetary value of total income, total expenditure, or total output of a country taking into account the effects of inflation.

What is a production possibility curve (PPC)?

A PPC is a curve that shows the various combinations of goods that an economy is able to produce at a given time when the quantity of all factors of production and technology (quality/productivity of the factors) are fixed and all factors are employed efficiently.

The economy can produce two types of goods: **capital goods** and **consumer goods**. At point A on the PPC all factors are employed efficiently and quantity $X_1$ of consumer goods and $C_1$ of capital goods are produced. If the country wants to produce more capital goods it has to take away factors from the production of consumer goods and use the factors to make capital goods. As fewer factors are now used to produce consumer goods the quantity...
that can now be made falls. As more factors are now used to produce capital goods it is possible to make more of them. This is shown in Figure 55.1 (on page 159) as the move from point A to point B. Output of capital goods increases from $C_1$ to $C_2$, and output of consumer goods falls from $X_1$ to $X_2$.

In order to increase the quantity of capital goods from $C_1$ to $C_2$, the country has to give up $X_1-X_2$ of consumer goods. The opportunity cost of the increase in the quantity of capital goods is the opportunity cost of the next best alternative forgone. If the economy is producing within the PPC it means that some factors are unemployed. It is not possible for the economy to produce at a point outside the PPC because it does not have enough factors or the factors are not productive enough to produce that quantity of goods.

Model sentence: When the economy is producing on the PPC, all factors are employed; therefore, the economy cannot increase the quantity of one good without reducing the quantity of the other.

Describe how economic growth can be shown on a PPC diagram and an AD/AS diagram

Short-run economic growth is an increase in real output caused by increases in aggregate demand or short-run aggregate supply. In the short run, a variable quantity of factors are added to a quantity of fixed factors to produce output. At real output $Y_1$, shown in Figure 55.2a, not all factors are employed. There is a deflationary gap, which is the difference between actual real output $Y_1$ and full-employment level of output $Y$. When AD increases from $AD_1$ to $AD_2$ (perhaps because the government has introduced an expansionary fiscal policy), firms increase output by employing more workers by using more of their existing fixed quantity of capital. Real output increases from $Y_1$ to $Y_2$ = $Y_f$. Unemployment of factors falls as more factors are employed to increase output in response to an increase in AD. This fall in unemployment and increase in real output is shown in Figure 55.2b, as a movement towards the PPC from point a to point b. The economy is producing more of both capital and consumer goods in response to increases in AD.

Model sentence: Short-run economic growth is caused by increases in AD and/or SRAS, and long-run economic growth is caused by increases in the quantity and/or quality of the factors of production.
2.3 Macroeconomic objectives: Economic growth

Explain how investment and improved productivity causes economic growth

Human capital is a measure of the quality of labour in terms of labour’s ability to produce goods and services. The better educated labour is and the more skills labour has, the greater the value of human capital. Investment in human capital comes mainly from education at schools, technical colleges and universities, training given by firms in the workplace, and the provision of healthcare services. Investment in human capital will increase labour productivity. Output per head increases, thereby increasing full-employment levels of output, shifting the LRAS curve to the right and the PPC outwards.

Increases in training will reduce occupational immobility caused by changing patterns of demand thereby reducing structural unemployment and the natural rate of unemployment. This increases the quantity of workers willing and able to work, thereby increasing potential output and shifting the LRAS curve to the right. It will also increase AD because the workers who are now employed earn an income, some of which will be spent. Better qualified, more highly skilled workers earn higher incomes leading to increases in AD.

The higher the value of human capital, the greater the ability to be inventive and innovative. For example, scientists and engineers make discoveries that lead to increases in the state of technology, which in turn lead to increases in the productivity of capital, which then leads to an increase in the full-employment level of output and a shift to the right of the LRAS curve.

Investment is expenditure by firms in the private sector and government on capital goods. It is a component of AD and, therefore, increases in investment lead to increases in AD, which in turn leads to increases in real output. Investment is the addition to the stock of capital; therefore, an increase in investment is an increase in the quantity of capital, which leads to an increase in full-employment level of output. Potential output increases leading to long-run economic growth and the LRAS curve shifts to the right and the PPC moves outwards.

When firms and the government invest it is likely that they will buy more technologically advanced capital that is more productive than the old capital. The increase in productivity means that potential output is greater, leading to long-run economic growth and the LRAS curve shifts to the right and the PPC moves outwards.

A country’s natural resources might include hydro-power, mineral water, oil, natural gas, tin, iron ore, lead, and timber. Many natural resources are non-renewable. Some countries are dependent on their natural resources for their income. Economies in the Middle East have grown through the extraction and sale of oil. In the UK the discovery and extraction of North Sea oil led to an increase in the potential output of the UK. When a country finds new reserves of a natural resource potential output increases causing the LRAS curve to shift to the right and the PPC to shift outwards. Also as more income is earned in the industries extracting the natural resources AD increases leading to a rise in real output.

Discuss the importance of improved productivity and the consequences of economic growth

Growing real incomes leads to increases in AD causing demand-pull inflation due to excess AD. Increases in the productivity of the factors of production increases the potential output of a country and shifts the LRAS curve to the right. Aggregate supply meets the higher levels of aggregate demand, thereby reducing the inflationary pressures. The strength of the inflationary pressure is determined by the rate of change in AD and

Subject vocabulary

| labour productivity | the quantity of goods that a worker produces in a given period of time |
| output per head | a measure of the productivity of the workforce (output divided by the number of workers) |
| occupational immobility | occurs when workers do not have the necessary skills to change jobs |
| structural unemployment | unemployment caused by a change in the type of labour firms demand. It is caused by a mismatch of the skills of those unemployed and the skills needed by firms |
| natural rate of unemployment | the rate of unemployment at which inflation stabilises. At the natural rate of unemployment, all who want to work at the market wage can find work therefore there is no involuntary unemployment |
| state of technology | the current level of technology that when put to use in the production of capital goods determines capital productivity |
| productivity | the quantity of output per unit of input |
| natural resources | assets, such as mineral deposits and timber, that occur in nature and can be used in production |
| real income | income after taking into account the effects of inflation on purchasing power |
| demand-pull inflation | occurs when aggregate demand is greater than aggregate supply |

Synonyms

| component(s) | ... part(s) |
| hydro-power | ... water power |
| extraction | ... removal |

Glossary

| ore | rock or earth from which metal can be taken |
| reserve(s) | supply(ies) of something that is/are kept and used when needed |
the rate of change in LRAS. If they increase at the same rate, the price level would not change. Supply-side policies introduced to increase productivity, such as subsidies paid to firms to increase the value of human capital, help to keep inflation down when AD starts to exceed aggregate supply. However, if AD is not strong enough, increases in productive capacity lead to excess capacity, causing a fall in the price level.

**Model sentence:** Rising real incomes leads to increasing AD and demand-pull inflation. However, inflationary pressures can be reduced by increases in long-run aggregate supply.

As households’ incomes rise, people are able to consume more goods and services. They are able to satisfy more wants. The standard of living and consumer welfare increase as the economy grows. As the economy grows it is possible for firms to increase investment in the research and development of new technologies and new goods. New goods create new demands that can be satisfied, thereby increasing consumer welfare.

Increases in the productivity of labour and capital lead to a fall in **average total cost**. Firms are able to sell at lower prices and still make a profit. This makes them more internationally competitive on price, leading to an increase in the **quantity demanded** of exports thereby increasing AD and improving the **current account balance**. However, increases in income can lead to increases in the demand for imports, thereby worsening the current account balance. The extent to which demand for imports increases after an increase in income is dependent on the nation’s **marginal propensity to import**.

**Model sentence:** Increases in investment lead to increases in productivity and lower average total costs, thereby increasing international competitiveness.

However, increases in a country’s output can lead to increases in the **negative externalities** created by production, such as higher carbon emissions, and may cause **market failure**. The quantity of natural resources, many of which are non-renewable, will fall as output increases leaving fewer resources available for future generations who will have to pay a higher price for them. As economies grow and output increases, natural resources might be reduced at such a rate that is not sustainable.

Higher incomes lead to an increase in **tax revenues**. Government has more tax revenue to spend on **merit goods** and **public goods** as well as investments in **infrastructure**, such as roads and telecommunications networks. Increased government spending on education and training, which are merit goods, may lead to increases in productivity. Improvements in transport infrastructure, for example, lead to increases in productivity because goods and workers can move more quickly, saving time and reducing transport costs.

Higher tax revenues may reduce the **budget deficit** and the government’s borrowing requirements. Over time the government may be able to reduce the **national debt**. This would reduce the **interest payments** on the debt thereby reducing the amount of tax taxpayers in the future must pay for interest payments leaving them more income to spend on goods and services. In the UK in 2013 the average household paid £1,900 in tax just to cover the interest payments on the national debt.

If more of a country’s factors are used for investment it is possible that there will be fewer factors available for the production of consumer goods. This is shown in Figure 55.1 (on page 159) as a movement from point a to point b. However, in the long run, greater investment leads to an increase in the productive capacity of the country and an outward shift in the PPC as shown in Figure 55.3b (on page 161). This means that the economy in the long run may be able to produce more of both capital and consumer goods and satisfy more wants, increasing society’s welfare. However, greater investment in capital can lead to higher levels of **technological unemployment** as capital is used in production instead of labour. However, the demand for labour to produce the capital and build the factories increases.

As economies grow over time they can move away from producing mainly agricultural output towards the production of manufactured goods. And as economies continue to grow, factors may be reallocated away from the production of manufactured goods and **heavy industry** towards the production of services. As economies grow they go through structural changes and this causes structural unemployment, where people are unemployed because the skills they have are not demanded by the current industries.

**Test your understanding of this unit by answering the following questions**

- Using diagrams, explain the distinction between short-run economic growth and long-run economic growth.
- Using diagrams, explain how investment in both human capital and physical capital can cause economic growth.
- Discuss the consequences of economic growth.
Learning Outcome

● Calculate the rate of economic growth from a set of data. (HL)

The calculation

The rate of economic growth is the rate of change in a country’s real GDP from one period of time to another expressed as a percentage. Usually the time period is one year but growth is regularly measured over quarters (3 months).

The formula used to calculate economic growth is set out below.

\[
\text{The rate of economic growth} = \frac{(\text{real GDP in time period 2} - \text{real GDP in time period 1})}{\text{real GDP in time period 1}} \times 100
\]

Below is listed real GDP from 2006 to 2009 for country ‘X’.

<table>
<thead>
<tr>
<th>Year</th>
<th>Country ‘X’ Real GDP (US$ millions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2006</td>
<td>1 680 044</td>
</tr>
<tr>
<td>2007</td>
<td>1 710 488</td>
</tr>
<tr>
<td>2008</td>
<td>1 790 562</td>
</tr>
<tr>
<td>2009</td>
<td>1 728 212</td>
</tr>
</tbody>
</table>

Calculate the rate of economic growth for country ‘X’ between 2006 and 2007 – a step-by-step guide

Trouble shooter

The rate of economic growth = \( \frac{(\text{real GDP in 2007} - \text{real GDP in 2006})}{\text{real GDP in 2006}} \times 100 \)

The rate of economic growth = \( \frac{(1 710 488 - 1 680 044)}{1 680 044} \times 100 \).

The rate of economic growth = \( \frac{30 444}{1 680 044} \times 100 \).

The rate of economic growth = 0.01812 \times 100.

The rate of economic growth in country ‘X’ between 2006 and 2007 was 1.81%.

Calculate the rate of economic growth between 2008 and 2009

Growth rate = \( \frac{(1 728 212 - 1 790 562)}{1 790 562} \times 100 = -62350 \times 100 = -0.0348 \times 100 = -3.48\% \).

The rate of economic growth in country ‘X’ between 2008 and 2009 was -3.48%.

Calculate the rate of economic growth between 2006 and 2009

Growth rate = \( \frac{(1 728 212 - 1 680 044)}{1 680 044} \times 100 = 48168 \times 100 = 0.0287 \times 100 = 2.87\% \).

The rate of economic growth between 2006 and 2009 was 2.87%.

The economy grew year on year between 2006 and 2008. Real GDP reached its highest point in 2008. Between 2008 and 2009 the country entered a recession experiencing a negative rate of growth of -3.48%. However, overall between 2006 and 2009 the country’s economy grew by 2.87%.

Test your understanding of this unit by answering the following questions

● Using the data set out in the table below, calculate the rate of economic growth for country ‘Y’ between each of the years and between 2010 and 2013.

● Describe the changes to economic growth between 2010 and 2013.

<table>
<thead>
<tr>
<th>Year</th>
<th>Country ‘Y’ Real GDP (€ millions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>2 420 488</td>
</tr>
<tr>
<td>2011</td>
<td>2 380 835</td>
</tr>
<tr>
<td>2012</td>
<td>2 340 903</td>
</tr>
<tr>
<td>2013</td>
<td>2 390 432</td>
</tr>
</tbody>
</table>
Learning Outcomes

- Explain the difference between equity in the distribution of income and equality in the distribution of income.
- Explain that due to unequal ownership of factors of production, the market system may not result in an equitable distribution of income.
- Analyze data on relative income shares of given percentages of the population, including deciles and quintiles.
- Draw a Lorenz curve and explain its significance.
- Explain how the Gini coefficient is derived and interpreted.

Subject vocabulary

- **factors of production** the inputs into the production process (land, labour, capital and entrepreneurship)
- **interest** the price paid for the use of borrowed money/ the money earned from bank deposits
- **savings** income that is not spent
- **income tax** a direct tax on individual earnings (wages, rent, profit, interest) and paid to the government
- **market** where buyers and sellers meet to exchange money for goods and services
- **shareholders** individuals or institutions that own at least one share in a company
- **share** a unit of ownership of a company’s capital. The owner is entitled to a proportion of the company’s profit.
- **asset** an item of value owned by an individual or firm, especially one that could be converted to cash
- **supply of workers** the quantity of workers who are willing and able to work at each wage in a given industry
- **revenue** the income a firm receives from consumers in exchange for goods (revenue = price × quantity sold)
- **equilibrium wage** the wage at which the quantity of labour supplied is equal to the quantity of labour demanded
- **labour market** a market in which firms demand labour and workers supply labour. The interaction of demand and supply of labour determines the equilibrium wage.

Distinguish between equality and equity in the distribution of income

Income is the payment made by firms to households for the use of the **factors of production**. Income is made up of wages, rent, profit, and interest. National income is the sum of all these payments made in a country over a given period of time, usually a year. The average income per head is calculated by dividing total national income by the population. The average income in the UK in 2013 was about £24,000. There are many people who earn much more than this amount and many who earn less. People do not earn the same amount of income; therefore, income is not distributed equally. There are many reasons for this, which will be discussed later in this unit. The amount of inequality of income can be studied, measured, and published. Equity means fairness or justice. What is fair to one person may not seem fair to another. Is income distribution equitable? This is a difficult question to answer. Answers may vary depending on personal opinions and circumstances.

Inequality of income is not always inequitable or unfair. It seems fair that a worker who does the same job in the same factory as another worker but works longer hours gets a greater wage. And if a worker saves some of his income it is fair that he receives **interest** payments from his **savings**. Another worker who spends all his income on satisfying present wants has no savings and therefore receives no interest payments. Again, income distribution is unequal but it is not necessarily unfair or inequitable.

Distinguish between horizontal equity and vertical equity

Horizontal equity occurs when people who are in the same situation are treated in the same way. For example, it is fair that two workers who earn £35,000 pay the same rate of **income tax**. If this does not happen it would be unfair. A woman applying for a job who has the same skills as the male applicant should have an equal chance of getting the job. The same is true of people of different ages, races, or religious beliefs. Any other outcome is unfair. Horizontal equity in a society means that people are not discriminated against in any situation on the basis of race, age, gender, or religion. Many countries have laws that make discrimination illegal in order to make society more equitable, although discrimination still occurs.

Vertical equity occurs when people earning different incomes are treated differently so as to make society more equitable. For example, those people that earn higher incomes pay a higher rate of tax. The government can then use the revenue to redistribute income more fairly and more equally.

Explain why the unequal ownership of factors may lead to an inequitable and unequal distribution of income

People receive different amounts of income in a **market**-based economic system because the ownership of the factors is not distributed equally. There are some people who can work, selling their labour to firms. There are some people who are not able to work and therefore cannot sell their labour in order to earn a wage. Some people own land and property, and receive rent. **Shareholders** receive a dividend payment each year which is a share of the company profits. Ownership of the resources can be built up over time. A person may inherit property and **shares**, and because these **assets** earn income that person may more easily be able to buy more property and shares, thereby increasing the amount of income earned. In time the accumulated assets can be passed on to the next generation. People who own assets earn more income and are therefore able to buy more assets that provide even more income. It can be argued that the distribution of income is becoming more unequal and inequitable. Those people on lower incomes are not given the same opportunity as others to buy assets and thereby increase their income. Often poorer people only own their labour and therefore can only earn a wage.

There is a high **supply of workers** who are unskilled or have few skills. Low skilled workers make relatively little extra **revenue** and profit for the firm. Because the wage firms are willing to pay for unskilled workers is low and the supply of unskilled workers is high, the **equilibrium wage** in this **labour market** is relatively low. There is a lower supply of skilled workers and, because they provide greater additional revenue and profit for a firm,
2.3 Macroeconomic objectives: Equity in the distribution of income

The price of shares is determined by the forces of demand and supply in the stock market. The dividend paid to the owner of shares is closely linked to its price. The price of property is determined by market forces in the property market. Demand for property, both commercial and residential, in central London is relatively high and supply is relatively low whereas in Sunderland, in the north of England, demand is much lower and supply higher. The excess demand in the property market in London pushes prices up and the excess supply in Sunderland pushes price down. Rents paid on property are linked to its price. Therefore, the income earned on property in London is relatively high and in Sunderland it is relatively low.

Firms in uncompetitive industries are able to reduce supply of the good and increase price thereby forcing the consumer to pay a higher price than the price that would be paid in a competitive market. The firm increases its profit at the expense of the consumers. Under imperfect competition there is a transfer of wealth from consumers to the shareholders. Some governments try to reduce monopoly power, by reducing or removing barriers to entry into industries and by making illegal anti-competitive behaviour such as destroyer pricing, so that new firms can enter the market and compete.

It is clear that the distribution of income is unequal. Governments in many countries are able to make the distribution more equitable. Taxing those on relatively high incomes more means the government is able to redistribute income to those on relatively low incomes. Income distribution will be more equal and more equitable. The government can encourage firms to give employees an opportunity to own shares in their business and by privatizing state monopolies can encourage people who would not normally buy shares to do so. The Conservative government in the UK during the 1980s tried to extend property and share ownership. Many state monopolies were privatized and many people bought shares. However, most of the shares were sold to financial institutions soon after they were bought. Many gained a quick profit on the sale but widespread share ownership did not last. People were encouraged to buy their council house (government-owned houses that were rented to people). The price was set below market price and many people did buy the houses they rented.

Most economists and politicians argue that an unequal distribution of income is a good thing because if every person earns the same income there would be little incentive to study hard at school and to work hard to learn new skills. The value of human capital would fall because there would be no opportunity to earn a higher income. All industries would become less productive and therefore less competitive. Real GDP would fall and most people would have less income. Economists and politicians often disagree about the optimum or best distribution of income.

Analyze data on relative income shares of given percentages of the population

Set out below in Table 57.1 are data on the distribution of income in four countries in 2010. The households are divided into quintiles ranging from the poorest to the richest. The percentage of the total national income they receive is calculated and listed under each of the quintiles. The distribution of income in the UK and Russia are similar. In the UK the poorest 20% of the population earns 6.14% of the total income and in Russia the poorest 20% earns 6.46% of the country’s income. The UK’s 2nd, 3rd, and 4th quintiles earn a little over 1% more of total income than in Russia. The poorest 20% in Argentina earn 4.48% of total income. This is less than in the UK and Russia. A much higher proportion of people in South Africa are poor. The poorest 20% earn less than 3% of the nation’s total income and the poorest 40% earn less than 8% of total income. Argentina’s richest 20% earn 49.36% of total income, just over 2% more than in Russia and just over 5% more than in the UK.

<table>
<thead>
<tr>
<th>Country</th>
<th>Poorest 20%</th>
<th>2nd 20%</th>
<th>3rd 20%</th>
<th>4th 20%</th>
<th>Richest 20%</th>
</tr>
</thead>
<tbody>
<tr>
<td>United Kingdom</td>
<td>6.14</td>
<td>11.41</td>
<td>15.96</td>
<td>22.47</td>
<td>44.02</td>
</tr>
<tr>
<td>Russia</td>
<td>6.46</td>
<td>10.35</td>
<td>14.77</td>
<td>21.29</td>
<td>47.13</td>
</tr>
<tr>
<td>Argentina</td>
<td>4.38</td>
<td>9.31</td>
<td>14.78</td>
<td>22.17</td>
<td>49.36</td>
</tr>
<tr>
<td>South Africa</td>
<td>2.7</td>
<td>4.63</td>
<td>8.16</td>
<td>16.3</td>
<td>68.21</td>
</tr>
</tbody>
</table>

Table 57.1 Source: Index Mundi
Subject vocabulary

decile one of the values of a variable that divides the distribution of the variable into ten groups having equal frequencies

Lorenz curve a graph on which the cumulative percentage of the population of a region is plotted against the cumulative percentage of its total income. The 45 degree diagonal straight line shows a perfectly equal distribution of income. The Lorenz curve bows beneath the diagonal line indicating an unequal distribution of income.

In South Africa, however, the richest 20% of the population earn almost 70% of the nation’s income. The percentage of total income earned by the first four quintiles is much lower than in the other three countries. Income is distributed most equally in the UK and least equally in South Africa.

Table 57.2 sets out the poorest 20% and the richest 20% in the UK and South Africa once the data have been divided into deciles. The table shows clearly the differences in the distribution of income between the two countries. The second poorest 10% of households in the UK earn 4.08% of total national income whereas in South Africa the second poorest 10% earn only 1.53%. The richest 10% of households in the UK earn 28.49% of income; in South Africa the richest 10% earn a much greater 51.69% of income.

<table>
<thead>
<tr>
<th>Country</th>
<th>Poorest 10%</th>
<th>2nd 10%</th>
<th>9th 10%</th>
<th>Richest 10%</th>
</tr>
</thead>
<tbody>
<tr>
<td>United Kingdom</td>
<td>2.06</td>
<td>4.08</td>
<td>15.53</td>
<td>28.49</td>
</tr>
<tr>
<td>South Africa</td>
<td>1.17</td>
<td>1.53</td>
<td>16.52</td>
<td>51.69</td>
</tr>
</tbody>
</table>

Table 57.2

Explain the significance of a Lorenz curve

Economists use a Lorenz curve to measure inequalities in the distribution of income. In Figure 57.1 the cumulative percentage of the population of a country is plotted on the horizontal axis and is set out in order of income earned. The cumulative percentage of its income is plotted on the vertical axis. The 45 degree line is called the ‘line of equality’. The 45 degree line shows each person earning the same percentage of income. The first 20% of the population earns 20% of the income, the next 20% of the population also earn 20% of the income and the top 20% of the population earn 20% of the income. Each person earns the same amount of income. Income is distributed perfectly equally.

The Lorenz curves are the bowed or curved lines, line 1 and line 2. Line 1 shows the distribution of income in one country; line 2 shows the distribution of income in another country. Both lines are bowed and therefore show an unequal distribution of income. Line 1 shows the poorest 20% of the population earn 10% of the income and the richest 20% earn 40% of income. Line 2 shows the poorest 20% earn 2% of income and the richest 20% earn 70% of income. The distribution of income is more unequal in the country represented by line 2, than in the country represented by line 1. The further away the Lorenz curve is from the 45 degree line of equality, the more unequal is the distribution of income.

Figure 57.1

Explain how the Gini coefficient is derived and what it means

Inequality in the distribution of income can be measured by the Gini coefficient. It is the ratio of the area above the Lorenz curve and below the 45 degree line (area A) to the area of the triangle that is below the 45 degree line (area A + B). The value of the Gini coefficient is between 0 and 1. As the Lorenz curve moves further away from the 45 degree line the proportion of area A to the total area below the 45 degree line gets bigger. The value of A/A+B gets bigger when A gets bigger. Therefore, the higher the value of the Gini coefficient the more unequal the distribution of income.

If income is distributed perfectly equally the coefficient is equal to 0. And if income is distributed perfectly unequally, so that one person earns 100% of the income and all the others earn 0% of the income, the Gini coefficient is equal to 1.

The Gini coefficient can be written as an index out of 100. Gini coefficient = 0.4 is the same as Gini index = 40. The Scandinavian counties have relatively low Gini indexes: Denmark’s Gini index = 24 and Sweden’s = 25. The governments of these countries redistribute income from the relatively high income earners to the relatively low...
Learning Outcomes

- Distinguish between absolute poverty and relative poverty.
- Explain possible causes of poverty, including low incomes, unemployment, and lack of human capital.
- Explain possible consequences of poverty, including low living standards, and lack of access to healthcare and education.
- Distinguish between direct and indirect taxes, providing examples of each, and explain that direct taxes may be used as a mechanism to redistribute income.
- Distinguish between progressive, regressive, and proportional taxation, providing examples of each.
- Calculate the marginal rate of tax and the average rate of tax from a set of data. (HL)

Explain the difference between absolute poverty and relative poverty

Absolute poverty occurs when people are not able to satisfy their basic needs. People who are homeless, who are unable to keep warm or who are underfed live in absolute poverty. Absolute poverty exists in all countries but there are more people living in absolute poverty in the less developed economies than in countries with relatively higher GDP. Given the size of national income in relatively wealthy countries, in theory the government could eliminate absolute poverty completely through the redistribution of income.

Relative poverty occurs when the standard of living of a person in society is low compared to the standard of living of others in society. When a person's income is less than a specified proportion of the average income, then that person is living in relative poverty.

Explain the causes of poverty

People who do not own any physical assets or financial assets and who are unskilled, who lack human capital are more likely to be poor. Those who do not own assets that provide income, such as savings accounts, shares, or property and whose labour is not demanded by firms cannot earn an income. Lack of human capital is caused by low educational achievement, such as the inability to read and write, and a lack of skills. Workers with these characteristics find it difficult to sell their labour to firms in the labour market. Supply of unskilled workers is high, which pushes down the wage. People who are well educated and have skills demanded by firms receive higher wages. In many countries there is an excess supply of unskilled workers so wages are low and many workers are unemployed. The amount of unemployment benefits varies from country to country, but in most cases those who are unemployed are relatively poorer than those who have jobs and are more likely to live in absolute poverty.

Explain the consequences of poverty

There are private costs and external costs created by poverty. People on very low incomes are much more likely to live in poor housing, have unhealthy diets, and are less likely to have access to high quality health services. Therefore, those living in poverty are more likely to suffer from poor physical and mental health, and die at a younger age.

Test your understanding of this unit by answering the following questions

- Explain why the distribution of the ownership of factors of production affects the distribution of income.
- The Gini index of country X is 24 and the Gini index of country Y is 65. Using a diagram, explain the significance of these statistics.

Subject vocabulary

<table>
<thead>
<tr>
<th>Glossary</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>elite</td>
<td>a group of people with a high level of power/influence because they have money/knowledge/skills</td>
</tr>
<tr>
<td>absolute poverty</td>
<td>occurs when people do not have enough resources to satisfy their basic needs</td>
</tr>
</tbody>
</table>

Subject vocabulary

<table>
<thead>
<tr>
<th>Glossary</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>GDP</td>
<td>gross domestic product is the monetary value of all the finished goods and services produced within a country in a given period of time, usually measured over a year</td>
</tr>
<tr>
<td>relative poverty</td>
<td>a measure of poverty that relates to the average income earned in a country or region. Definitions vary but many governments define it as an income less than 50% of the median income.</td>
</tr>
<tr>
<td>human capital</td>
<td>the store of knowledge and the set of skills that a worker possesses which can be used in the production process. The higher the value of human capital the more productive the worker is. Human capital can be improved through investment in education and training.</td>
</tr>
<tr>
<td>labour market</td>
<td>a market in which firms demand labour and workers supply labour. The interaction of demand and supply of labour determines the equilibrium wage.</td>
</tr>
<tr>
<td>excess supply</td>
<td>occurs when quantity supplied is greater than quantity demanded</td>
</tr>
</tbody>
</table>

continued on page 166
Some economists and sociologists say there is a link between poverty and crime. Some people who are unable to earn a sufficient income engage in criminal activities such as theft. High levels of unemployment and poverty can lead to social unrest, such as rioting and violent protest.

The external costs of poverty are high. Resources have to be used to police social unrest and crime. Bad diets and unhealthy living conditions lead to greater demands on health service providers. And those who are poor, unskilled, or uneducated are a wasted resource because they do not make a positive contribution to GDP. Many governments are aware of the private and external costs, and want to reduce these costs. A more equal distribution of income is therefore an objective of some governments.

### Distinguish between direct tax and indirect tax

A tax is a direct tax when the tax paid goes directly from those who owe the tax to the government. Income tax is a direct tax because the amount of tax charged on the wage earned is paid directly to the government. Usually this is done by the employer on behalf of the worker. Corporation tax is a tax on company profits which is paid directly from the company to the government. Dividend payments and the interest paid on savings are taxed, and the tax is paid straight to the government by the income earner. Legally, these taxes are unavoidable because income earners must tell the government how much income they have earned.

Indirect tax does not go directly to the government. Indirect taxes are taxes on expenditure. Examples include 'value added tax' (VAT) in the UK and 'goods and services tax' (GST) in Australia. When the consumer buys a good or service, the tax charged on the sale is included in the price paid by the consumer. The seller of the good collects the tax and then sends the tax to the government. Households are able to avoid paying indirect tax by not buying the goods; however, basic necessities such as fuel and clothes are taxed so it is impossible to avoid paying taxes completely.

### Distinguish between progressive, regressive, and proportional taxation

A progressive tax is a tax where the proportion or percentage of income that is taxed (the rate of tax) increases as income increases. For example, the Federal tax brackets in 2013 on taxable income for a single person in the US were as follows:

<table>
<thead>
<tr>
<th>Income $</th>
<th>Tax bracket %</th>
</tr>
</thead>
<tbody>
<tr>
<td>0–8925</td>
<td>10</td>
</tr>
<tr>
<td>8925–36 250</td>
<td>15</td>
</tr>
<tr>
<td>36 250–87 850</td>
<td>25</td>
</tr>
<tr>
<td>87 850–183 250</td>
<td>28</td>
</tr>
<tr>
<td>183 250–398 350</td>
<td>33</td>
</tr>
<tr>
<td>398 350–400 000</td>
<td>35</td>
</tr>
<tr>
<td>400 000 and above</td>
<td>39.6</td>
</tr>
</tbody>
</table>

It can be seen in the data above that the rate at which income is taxed increases as income rises. For example, a single person earning $40,000 pays 10% tax on $8,925, 15% on income earned between $8,925 and $36,250, and 25% on income between $36,250 and $87,850.

**Model sentence:** The marginal rate of tax is the rate of tax paid on the next unit of currency earned. In the case of a progressive income tax, the marginal rate of tax increases as income rises from one tax bracket to the next.

A regressive tax is a tax for which the proportion or percentage of income that is taxed decreases as income increases and increases as income falls. This type of tax does not take into account the amount of income a person earns. It does not take into account the 'ability to pay'. Indirect taxes are regressive taxes. Take two people: one earns $20,000 and the other earns $40,000. Each buys a car and each pays a sales tax of $1,000. The amount paid in tax is the same, but the percentage of tax paid is different: $1,000 is 2.5% of $40,000 ((1,000/40,000) × 100 = 2.5%), whereas $1,000 is 5% of $20,000 ((1,000/20,000) × 100). The tax is regressive because the percentage rate of tax is higher for the person on a lower income. As incomes fall, the rate of tax increases.
A proportional tax is a tax for which the proportion or percentage of tax that is paid does not change as income changes. For example a person earning an income of $20 000 pays the same rate of tax as a person earning $40 000. A 10% rate of tax on $20 000 = $2 000 tax paid. On $40 000 $4 000 is paid in tax. Although the rate of tax is the same, the higher the income, the higher the actual amount of tax paid. Some countries are moving towards a proportional or flat tax rate system. (An evaluation of this system appears on pages 171–73.)

Model sentence: For progressive taxes, the percentage of income paid in tax increases as income increases; for regressive tax, the percentage of income paid in tax falls as income increases; and for proportional tax, the percentage of income paid in tax stays the same as income increases.

Explain how direct taxes may be used to redistribute income

The tax system used by a government plays an important role in how income is distributed. A government can introduce a more progressive tax system in order to redistribute income away from richer people to poorer people. Taxes raised by government can be used to increase transfer payments from those on higher income to those on lower income. For example the tax revenue can be used to fund increases in unemployment benefit. The Scandinavian countries have the lowest Gini indexes, showing that income is distributed more equally in these countries than anywhere else in the world. These countries also have the highest marginal rates of tax in the world. Those countries with high Gini indexes tend to have low marginal rates of tax. Some politicians and economists argue that more tax revenue should be raised from progressive taxes on income and less from regressive taxes on expenditure because it is more equitable.

Model sentence: Progressive taxation takes into account the ability to pay the tax. A move away from a regressive tax system to a more progressive one is likely to lead to a more equal distribution of income.

(Government policy introduced in order to redistribute income is evaluated on pages 171–73.)

Calculate the marginal rate of tax and the average rate of tax from a set of data (HL)

The average rate of tax (ART) is the tax paid divided by gross income multiplied by 100. Gross income is income earned before deductions, such as income tax, are made. Net income is the actual amount received by the worker after all deductions have been made.

\[
\text{ART} = \left( \frac{\text{tax paid}}{\text{gross income}} \right) \times 100
\]

The marginal rate of tax (MRT) is the change in tax divided by the change in gross income multiplied by 100.

\[
\text{MRT} = \left( \frac{\text{change in tax}}{\text{change in gross income}} \right) \times 100
\]

Table 58.2 shows the marginal rates of tax on income earned in country X:

<table>
<thead>
<tr>
<th>Gross income $</th>
<th>MRT %</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 000</td>
<td>10</td>
</tr>
<tr>
<td>10 001–20 000</td>
<td>20</td>
</tr>
<tr>
<td>20 001–30 000</td>
<td>30</td>
</tr>
<tr>
<td>30 001–50 000</td>
<td>40</td>
</tr>
<tr>
<td>50 000 and above</td>
<td>50</td>
</tr>
</tbody>
</table>

Table 58.2
Subject vocabulary
continued from page 171
quasi-public goods goods that share some of the characteristics of public goods but are not fully non-excludable and non-rival. A road is an example. Most roads are free at the point of use but it is possible to make people pay through tolls and when traffic is heavy the amount available to others to use does begin to diminish so there can be rivalry in consumption.
private sector the part of the economy that is regulated but not controlled by the state and concerns individuals and groups bringing together the factors of production normally with the aim of making a profit
value of human capital a measure of the quantity and quality of the skills of the labour force that can be employed to produce goods and services. An increase in the value of human capital leads to an increase in labour productivity.
productivity the quantity of output per unit of input
cycle of poverty occurs in a country which has low income and therefore low levels of savings. Low levels of savings means little investment can take place and the economy is unable to grow, thus income remains low.
redundancy payment a sum of money paid by the employer to a former employee who has been made redundant (laid off work)
sick pay a sum of money paid by an employer to an employee who is not working due to illness
relative poverty a measure of poverty that relates to the average income earned in a country or region. Definitions vary but many governments define it as an income less than 50% of the median income.
real-wage unemployment occurs when the real wage is above the equilibrium wage thereby causing an excess supply of labour

classical/real-wage unemployment when wages are above the market clearing level leading to an excess supply of labour
excess supply occurs when quantity supplied is greater than quantity demanded

Using the data in Table 58.1, calculate the MRT for a worker who receives a pay increase from $30 000 to $45 000 (HL)

At $30 000 the worker was paying in tax:

- ($10 000 × 10%) = $1 000
- ($10 000 × 20%) = $2 000
- ($10 000 × 30%) = $3 000
- ($15 000 × 40%) = $6 000

Total tax paid = $12 000

At $45 000 the worker is now paying:

- ($10 000 × 10%) = $1 000
- ($10 000 × 20%) = $2 000
- ($10 000 × 30%) = $3 000
- ($15 000 × 40%) = $6 000
- ($15 000 × 50%) = $7 500
- ($15 000 × 50%) = $7 500

Total tax paid increases from $12 000 to $24 000 as income increases from $30 000 to $45 000.

MRT = (change in tax/change in gross income) × 100 = ($12 000/$15 000) × 100 = 40%

Test your understanding of this unit by answering the following questions

- Distinguish between progressive, regressive, and proportional taxation.
- Explain possible causes of poverty.
- Explain possible consequences of poverty. Distinguish between the private costs and external costs.
- Using the data set out in the table below, calculate the average rate of tax for a worker earning £25 000 and the marginal rate of tax for a worker who receives a pay increase from £28 000 to £64 000.

<table>
<thead>
<tr>
<th>Gross income £</th>
<th>MRT %</th>
</tr>
</thead>
<tbody>
<tr>
<td>0–10 000</td>
<td>0</td>
</tr>
<tr>
<td>10 000–15 000</td>
<td>10</td>
</tr>
<tr>
<td>15 000–20 000</td>
<td>15</td>
</tr>
<tr>
<td>20 000–30 000</td>
<td>20</td>
</tr>
<tr>
<td>30 000–50 000</td>
<td>30</td>
</tr>
<tr>
<td>60 001 and above</td>
<td>50</td>
</tr>
</tbody>
</table>
2.3 Macroeconomic objectives: Equity in the distribution of income

Learning Outcomes

- Explain that governments undertake expenditures to provide directly, or to subsidize, a variety of socially desirable goods and services (including healthcare services, education, and infrastructure that includes sanitation and clean water supplies), thereby making them available to those on low incomes.

- Explain the term transfer payments, and provide examples, including old-age pensions, unemployment benefits, and child allowances.

- Evaluate government policies to promote equity (taxation, government expenditure, and transfer payments) in terms of their potential positive or negative effects on efficiency in the allocation of resources.

The government collects taxes and uses the tax revenue to provide many goods and services, particularly merit goods that are underprovided and under consumed if left to the free market, and public goods that would not be supplied at all. Governments provide such goods in order to correct market failure. The government in many countries provides education services and health services so that society benefits from the positive externalities and private benefits of consumption of them. Infrastructure, often quasi-public goods, such as water and sewage services, transport infrastructure, and social housing are provided by the government. The government either provides these goods or services directly or the government pays subsidies to firms in the private sector to provide them. (See pages 36–38 for a detailed explanation of how a subsidy increases supply and consumption of merit goods.) Governments provide these goods and services because if they were left to the free market people on low incomes would not have enough money to buy them.

For example, in countries where education is not provided by the government, many children do not go to school because their parents cannot afford to buy educational services in the private market. Governments in countries with low GDP often do not have enough tax revenue to pay for these goods and services. Therefore, it is very difficult to raise the value of human capital and improve the quality of life of the citizens. When the state provides education for all young people each person is given the same opportunity. Young people in low income families are not discriminated against thereby making society more equitable. An education gives them a greater opportunity to earn a higher income in the future, thereby possibly making the distribution of income more equal.

Model sentence: A country where the human capital is poor and where the infrastructure is basic will have very low productivity and will not be able to escape the cycle of poverty.

What are transfer payments?

A transfer payment is a payment made by the government to a person for which no good or service is provided. They are payments made in order to increase the income of certain people in the economy. Transfer payments are used to redistribute income from those on relatively high incomes to those on relatively low incomes. Examples include unemployment benefit and state pensions. Governments also subsidize university tuition fees, the cost of heating a home, and rents.

Comment on government policies to promote equity and to distribute income more equally

Governments introduce laws to promote equity. Discrimination based on age, sex, race, and religion is illegal in many countries. This is to ensure that in society all people are treated equally and have equal opportunities. Employers are made to provide more than just a wage. Workers who lose their jobs are given a redundancy payment if workers are ill, firms provide sick pay. All firms must pay a minimum wage set by the government. A higher minimum wage may lift people out of absolute poverty and reduce relative poverty. A higher wage acts as an incentive for people to supply their labour. People are more likely to come off state benefits and find a job if the wage is greater than benefits. However, a high minimum wage can cause real-wage unemployment or classical unemployment. As wages rise, firms demand less labour but supply of labour increases, leading to an excess supply of labour and an increase in unemployment. If the cost to the firm of employing workers increases, ceteris paribus, fewer workers will be employed by the firm, leading to an increase in unemployment and perhaps an increase in income inequality.

Transfer payments affect behaviour. High welfare benefits introduced to reduce poverty and to make society more equitable discourage workers from seeking a job, thereby reducing economic activity and GDP.
Increasing tax rates discourages workers from working longer hours because after-tax income falls. Workers are less likely to work overtime or come off benefits to start work. High marginal rates of tax discourage workers from developing new skills and seeking promotion. And some people may decide to work in another country where tax rates are lower. Overall this has a negative effect on GDP.

If the government increases the tax rate on profit it may lead to less economic activity. Entrepreneurs take a risk by investing resources into starting up businesses. They may lose a lot of money if the business is not successful and has to close. They are willing to take the risk because there is a chance a profit can be made. The greater the possible profit, the more likely they are to start a business and take that risk. As tax rates increase, the profit that is kept by the entrepreneur falls and therefore the incentive to take the risk and start a business falls. Fewer small businesses will be started. Small businesses can grow and make important contributions to employment and GDP.

**Model sentence:** Higher tax rates discourage entrepreneurial risk-taking and thereby negatively affect future levels of GDP.

Existing companies will be affected by increases in corporation tax. A higher tax rate reduces retained profit and therefore reduces the amount of profit available for investment. The lack of investment in more technologically advanced capital would mean that productivity does not increase. Average total cost would remain higher, possibly leading to higher prices and a fall in international competitiveness and a loss of jobs in exporting industries. Investment is essential for economic growth. Lower taxes lead to greater investment and an increase in real output. In the long run, all people will receive more income. More capital goods will be produced, as tax increases fewer foreign firms will invest in a country, leading to a fall in the amount of inward investment, thereby reducing GDP.

**Model sentence:** High corporation tax discourages foreign direct investment and acts as an incentive for domestic firms to move abroad, thereby negatively affecting GDP.

Some economists say that redistributing income can increase society’s benefit or utility. The benefit or utility gained from the consumption of a good diminishes as more of the good is consumed. This is the law of diminishing marginal utility. People on low incomes consume fewer goods than people on higher incomes. If $20 is taken from a rich person and given to a poor person then the utility the poor person gains from the consumption of a good bought with the $20 is greater than the utility the rich person would gain because the rich person will consume more anyway, and therefore the marginal utility is lower. Therefore, by redistributing income the sum of utility of the rich person and the poor person is increased. A poor person may not be able to satisfy his needs. If a relatively high income earner spent $100 on his tenth pair of jeans he gains utility from its consumption. However, if the $100 was given to a poor person to feed his hungry family the utility gained would be greater than the utility the rich person gained from the consumption of the jeans. The $100 spent by the poor person gained more utility than if spent by the rich person. Therefore, redistributing the $100 increases society’s total utility.

**Model sentence:** According to the law of diminishing marginal utility, total utility can be increased by redistributing income away from rich people to poor people.

However, it is impossible to compare the utility gained from the consumption of a good between individuals so it can be argued that redistributing income might not lead to an increase in society’s total utility.

Governments intervene in markets in order to redistribute income because they believe that resources are not allocated in way that is fair by market forces. Government expenditure is used to correct a misallocation of resources when the existence of positive externalities leads to market failure. In these cases government intervention can lead to a greater allocative efficiency. Redistribution of income can lift people out of poverty and provide opportunities for people to make a positive contribution to economic growth. Also redistribution of income can increase society’s overall utility. However, government intervention can lead to allocative inefficiency. A redistributive tax system affects the behaviour of economic agents. Higher transfer payments and higher taxes discourage people from working, and reduce the amount of investment and entrepreneurial activity. In the long run, economic activity falls, leading to higher levels of unemployment, lower real incomes, and an increase in poverty.

**Model sentence:** It is difficult for the government to create a tax system that promotes equity and, at the same time, provides the right set of incentives that will lead to higher economic growth.

The poor have a relatively high marginal propensity to consume and a relatively low marginal propensity to save. This means they spend a relatively high proportion of extra income received and save a relatively
low proportion of extra income. Redistributing income away from relatively high income earners to those on relatively low incomes therefore leads to a greater level of consumption and a lower level of saving in the economy. Redistribution of income therefore can lead to higher levels of aggregate demand.

Explain why increasing the tax rate in order to redistribute income may lead to a fall in tax revenue

Tax rates on higher incomes may be increased by a government in order to raise more tax revenue so that income can be redistributed. However, increasing tax rates may lead to a fall in revenue not an increase.

As shown in the Laffer curve, Figure 59.1, at 0% tax rate no tax revenue is made. When tax rates are 100%, no tax revenue is made because nobody has an incentive to work if all income earned is taken by the government. Therefore, it must be the case that tax revenue is maximized at a tax rate between 0% and 100%.

Figure 59.1

As the tax rates increase from 0%, the government begins to collect tax revenue. However, when tax rates have increased to a certain level tax revenue begins to fall. In the diagram tax revenue is maximized at t*. An increase in the tax rate beyond t* leads to a fall in tax revenue. This occurs because high tax rates act as a disincentive to work and act as a disincentive to declare taxable income. For example, workers will do work for ‘cash in hand’ rather than telling the government about their earnings. If tax on profits is high, fewer entrepreneurs will start up businesses because the incentive to do so falls as tax rates increase. High tax rates reduce entrepreneurial activity and risk taking, thereby reducing investment. High tax rates can have a negative effect on productivity and potential output of an economy and may lead to a slower rate of economic growth. Therefore, it can be argued that increasing tax rates may lead to a fall in tax revenue and reducing tax rates may lead to an increase in tax revenue.

Test your understanding of this unit by answering the following questions

- Comment on the possible consequences of a tax system put in place in order to reduce income inequality and to promote equity.
- Using a diagram, explain why reducing the tax rate may increase tax revenue.