

Government intervention: microeconomic and macroeconomic policy (AS notes)

These notes cover the two AS topics on government intervention in Cambridge International AS & A Level Economics (9708). The first part covers **government microeconomic intervention**: why governments step into individual markets and how they do it. The reasons include market failure, merit and demerit goods, public goods, externalities and information failure. The methods include maximum and minimum prices, taxes and subsidies (and who bears them), direct provision, regulation, transfer payments, and policies on income and wealth inequality. The second part covers **government macroeconomic intervention**: fiscal, monetary and supply-side policy. For each one you will find its aims, its tools, its effects on output, employment, inflation and the current account, and its limitations. Diagrams are described in words and tables. All the numerical examples are invented, and every step of the working is shown. A few boxes are marked **A Level extension**. They are useful background for evaluation, but AS questions will not ask for them.

1. Why governments intervene in markets

A free market uses the price mechanism to allocate resources. It usually does this well, but not always. **Market failure** happens when the free market allocates resources inefficiently, so society ends up with too much or too little of a good. Governments also step in for reasons of **equity** (fairness), for example when the market distribution of income is seen as too unequal.

Learn these definitions

Market failure: a situation in which the free market fails to allocate resources efficiently, so the allocation does not maximise society's welfare.

Allocative efficiency: the situation in which resources are allocated so that the goods and services produced are those most wanted by society.

A Level extension: in a single market, allocative efficiency is where marginal social benefit equals marginal social cost ($MSB = MSC$), or where price equals marginal cost ($P = MC$).

1.1 Merit goods and demerit goods

Merit good: a good that is more beneficial to the consumer than the consumer realises. Left to the market, it is under-consumed.

Demerit good: a good that is more harmful to the consumer than the consumer realises. Left to the market, it is over-consumed.

The key idea is **information failure**: consumers misjudge the private benefit or harm. Vaccinations, school education and health check-ups are common examples of merit goods. Cigarettes, sugary fizzy drinks and gambling are common examples of demerit goods. Many merit goods also give **positive externalities** (a vaccinated person protects others too), and many demerit goods give **negative externalities** (second-hand smoke). Do not confuse the two ideas, though. A good is a merit good because of what the consumer fails to understand about their own benefit. An externality is about the

effect on *third parties*.

Whether a good is a merit or demerit good is partly a **value judgement**. The government is deciding what is "good for" people. In an evaluation answer you can question whether the government knows better than the consumer.

1.2 Public goods

Public good: a good that is non-excludable and non-rival.

Non-excludable: once the good is provided, it is impossible (or too costly) to stop people who have not paid from benefiting.

Non-rival: one person's consumption does not reduce the amount available for others.

Because people cannot be excluded, each person has an incentive to be a **free rider**, enjoying the good without paying. Private firms cannot charge enough to cover their costs, so the good is not supplied at all. This is a **missing market**, the most extreme form of market failure. Examples are national defence, street lighting, flood barriers and lighthouses.

Private goods are the opposite: they are excludable and rival (a mango, a bus ticket). **Quasi-public goods** have the public-good characteristics only in part. An uncrowded road is nearly non-rival until it becomes congested, and tolls can make it excludable.

Feature	Private good	Public good	Quasi-public good
Excludable?	Yes	No	Partly (e.g. toll road)
Rival?	Yes	No	Partly (e.g. rival when crowded)
Free-rider problem?	No	Yes, severe	Some
Provided by the free market?	Yes	No (missing market)	Sometimes, often under-provided
Example	A school uniform	A national early-warning system for floods	A city park, a motorway

1.3 Externalities

Externality: a cost or benefit that affects a third party who is not directly involved in the transaction. It is not reflected in the market price.

Buyers and sellers consider only their own (private) costs and benefits and ignore the effects on third parties. As a result:

- **Negative externalities** (e.g. a brick kiln releasing smoke over nearby homes) mean the good is **over-produced or over-consumed**. The market price is too low because it does not include the cost imposed on others.
- **Positive externalities** (e.g. a person's education raising the productivity of their co-workers) mean the good is **under-produced or under-consumed**, because buyers do not count the benefit to others.

Either way, the market does not produce the quantity that is best for society as a whole, so resources are misallocated. This is a reason for taxes (Section 2.3), subsidies (Section 2.4) and regulation (Section 2.6).

A Level extension (useful background): social costs and benefits

Social cost = private cost + external cost ($MSC = MPC + MEC$)

Social benefit = private benefit + external benefit ($MSB = MPB + MEB$)

The market settles where $MPB = MPC$. The socially optimal output is where $MSB = MSC$.

Negative externality of production: MSC lies above MPC , and the market output is greater than the optimal output. The **welfare loss** is a triangle lying between MSC (above) and $MPB = MSB$ (below), running from the optimal quantity to the market quantity, with its point at the optimum.

Positive externality of consumption: MSB lies above MPB , and the market output is smaller than the optimal output. The welfare loss is a triangle lying between MSB (above) and $MPC = MSC$ (below), running from the market quantity to the larger optimal quantity, with its point at the optimum.

1.4 Information failure

Information failure occurs when buyers or sellers lack the information they need to make rational decisions. Two forms matter at AS:

- **Imperfect information:** consumers do not know the true benefits or harms of a product. This is the root cause of merit and demerit goods.
- **Asymmetric information:** one side of a transaction knows more than the other. For example, a used-car seller knows about hidden faults but the buyer does not, and a doctor knows far more than the patient about which treatment is needed.

1.5 Equity

Even when a market is efficient, the outcome may be seen as unfair. For example, the market may leave some households without basic healthcare. Intervention for equity is covered in Section 3.

2. Methods and effects of government microeconomic intervention

2.1 Maximum prices

Maximum price (price ceiling): a legal limit set by the government above which the price of a good may not rise. It must be set **below** the equilibrium price to have any effect.

Aims: to make necessities such as staple foods, rented housing or medicines affordable to low-income households, and to protect consumers from monopoly pricing.

Diagram in words: draw normal demand and supply curves with equilibrium price P_e and quantity Q_e . Draw a horizontal line at the maximum price P_{max} , below P_e . At P_{max} , the quantity demanded (read from the demand curve) is greater than the quantity supplied (read from the supply curve). The horizontal gap between them is the **shortage** (excess demand). Neither curve shifts. There is a movement along both curves.

Worked example 1: a maximum price on cooking gas cylinders

In a market for cooking gas cylinders, demand and supply are given by:

$$Q_d = 200 - 4P \quad \text{and} \quad Q_s = -40 + 6P$$

where P is the price in dollars and Q is in thousands of cylinders per week.

Step 1: find the free-market equilibrium. Set $Q_d = Q_s$:

$$200 - 4P = -40 + 6P \rightarrow 240 = 10P \rightarrow P = \$24$$

$$Q = 200 - 4(24) = 200 - 96 = 104 \text{ thousand cylinders per week.}$$

Step 2: apply a maximum price of \$20.

$$Q_d = 200 - 4(20) = 200 - 80 = 120 \text{ thousand}$$

$$Q_s = -40 + 6(20) = -40 + 120 = 80 \text{ thousand}$$

Step 3: find the shortage. $120 - 80 = 40$ thousand cylinders per week.

Step 4: interpret. The consumers who get a cylinder pay \$4 less than before. However, only 80 thousand are sold instead of 104 thousand, so 24 thousand fewer cylinders are traded.

Consequences and limitations:

- Shortages lead to queues, waiting lists or allocation by rationing (first come, first served; coupons; favouritism).
- A **shadow (black) market** may develop. Some buyers are willing to pay far more than P_{max} , so goods get resold illegally at higher prices.
- Producers may cut quality to reduce costs. For example, landlords under rent control may neglect repairs.
- In the long run supply may fall further as firms leave the industry.
- The effect depends on elasticity. The more price-elastic demand and supply are, the larger the shortage.

2.2 Minimum prices

Minimum price (price floor): a legal limit set by the government below which the price of a good may not fall. It must be set **above** the equilibrium price to have any effect.

Aims: to raise and stabilise farmers' incomes (a guaranteed support price for wheat, for example), to discourage consumption of demerit goods (such as a minimum price per unit of alcohol), and to protect low-paid workers (a **national minimum wage** is a minimum price for labour).

Diagram in words: draw a horizontal line at P_{min} , above P_e . At P_{min} , the quantity supplied is greater than the quantity demanded. The gap between them is a **surplus** (excess supply). If the government promises to buy the surplus at P_{min} , its spending is shown by a rectangle: width = surplus, height = P_{min} .

Worked example 2: a support price for a crop

Use the same equations as Worked example 1, now for a crop: $Q_d = 200 - 4P$ and $Q_s = -40 + 6P$

(P in \$ per bag, Q in thousand bags per week). The equilibrium is $P = \$24$, $Q = 104$ thousand.

The government sets a minimum price of \$30 per bag and buys any surplus.

$$Q_d = 200 - 4(30) = 200 - 120 = 80 \text{ thousand bags}$$

$$Q_s = -40 + 6(30) = -40 + 180 = 140 \text{ thousand bags}$$

$$\text{Surplus} = 140 - 80 = 60 \text{ thousand bags}$$

$$\text{Cost to government} = \text{surplus} \times \text{minimum price} = 60\,000 \times \$30 = \mathbf{\$1\,800\,000 \text{ per week}}$$

Farmers' total revenue: before = $24 \times 104\,000 = \$2\,496\,000$. After = $30 \times 140\,000 = \$4\,200\,000$ (of which \$1 800 000 comes from the government and \$2 400 000 from consumers).

Limitations: the scheme has a large opportunity cost to the government. The surplus has to be stored or destroyed, or dumped abroad, which harms farmers in other countries. Consumers pay higher prices, which hurts low-income households the most. Inefficient producers are protected. With a minimum wage set above the equilibrium, the surplus of labour is **unemployment**. How large it is depends on the wage elasticities of demand for and supply of labour.

2.3 Indirect taxes and their incidence

Indirect tax: a tax on spending on goods and services, collected from producers, who can pass some of it on to consumers.

Specific tax: a fixed amount per unit (e.g. \$2 per litre). The supply curve shifts vertically upwards by the amount of the tax, **parallel** to the original.

Ad valorem tax: a percentage of the price (e.g. 17% sales tax). The supply curve **pivots** upwards, and the gap widens as price rises.

Incidence of a tax: how the burden of the tax is shared between consumers and producers.

Why tax? To raise revenue, to reduce consumption of demerit goods, and to make polluters pay for negative externalities. If the tax per unit equals the marginal external cost at the socially optimal output, the market moves to that optimal output. This is called **internalising the externality**.

Worked example 3: incidence of a specific tax

The market for bottled soft drinks (price in \$ per crate, quantity in crates per day):

Price (\$)	Quantity demanded	Quantity supplied (before tax)	Quantity supplied (after \$1.50 tax)
8	600	300	150
9	550	400	250
10	500	500	350
11	450	600	450
12	400	700	550
13	350	800	650

The table follows the equations $Q_d = 1000 - 50P$ and $Q_s = -500 + 100P$ (check: at $P = 10$ both give 500). After the tax, firms keep only $(P - 1.50)$, so $Q_s = -500 + 100(P - 1.50) = -650 + 100P$. For example, at a price of \$11 firms keep \$9.50, and $-650 + 100(11) = 450$.

Step 1: equilibrium before tax. $Q_d = Q_s = 500$ at $P = \$10$.

Step 2: equilibrium after tax. $Q_d = \text{new } Q_s = 450$ at $P = \$11$. Consumers now pay \$11.

Step 3: price producers keep. $\$11 - \$1.50 = \$9.50$.

Step 4: incidence per unit. Consumers pay $\$11 - \$10 = \$1.00$ more. Producers receive $\$10 - \$9.50 = \$0.50$ less. Check: $\$1.00 + \$0.50 = \$1.50$, which equals the tax.

Step 5: totals.

Total tax revenue = tax per unit $\times$ new quantity = $\$1.50 \times 450 = \text{\$675 per day}$

Consumer burden = $\$1.00 \times 450 = \450 ; producer burden = $\$0.50 \times 450 = \225 . Check: $450 + 225 = 675$.

Step 6: interpret. Consumers bear two-thirds of the tax. This is because demand is less price-elastic than supply over this range. At the original equilibrium, $PED = (-50 \div 500) \div (1 \div 10) = -1$ and $PES = (100 \div 500) \div (1 \div 10) = 2$. Demand (numerical value 1) is less price-elastic than supply (2). Comparing how much each quantity changes per \$1 only works here because both curves pass through the same point (\$10, 500 crates); in general, compare elasticities, not slopes.

On a diagram: the tax revenue rectangle has height from \$9.50 to \$11 and width 450. Its upper part (\$10 to \$11) is the consumer burden and its lower part (\$9.50 to \$10) is the producer burden.

Rule for incidence: the side of the market that is **less price-elastic** bears more of the tax. When demand is perfectly inelastic, consumers bear all of it. When demand is perfectly elastic, producers bear all of it. This is why governments like taxing goods with inelastic demand, such as fuel and cigarettes: revenue is high and quantity barely falls. The same fact, though, means the tax does little to cut consumption of such demerit goods.

Limitations of indirect taxes: it is hard to measure the external cost accurately. Indirect taxes are usually **regressive**, taking a larger share of the income of poor households. Heavy taxes encourage smuggling and illegal markets. When demand is inelastic, consumption falls only a little.

2.4 Subsidies and their incidence

Subsidy: a payment by the government to producers (or consumers) that reduces the cost of production or the price paid. A specific subsidy shifts the supply curve vertically **downwards** (to the right) by the amount of the subsidy per unit.

Why subsidise? To increase consumption of merit goods and goods with positive externalities, to keep essential goods affordable, to support infant or strategic industries, and to protect jobs.

Worked example 4: incidence of a specific subsidy

Take the same market as Worked example 3 before the tax. Its table fits $Q_d = 1000 - 50P$ and $Q_s = -500 + 100P$, with equilibrium \$10 and 500 crates. Instead of a tax, the government pays a subsidy of \$1.50 per crate.

Step 1: new supply. Firms now receive $P + 1.50$ for each crate, so $Q_s = -500 + 100(P + 1.50) = -350 + 100P$.

Step 2: new equilibrium. $1000 - 50P = -350 + 100P \rightarrow 1350 = 150P \rightarrow P = \9 . $Q = 1000 - 50(9) = 550$ crates.

Step 3: price producers receive. $\$9 + \$1.50 = \$10.50$.

Step 4: who gains per unit? Consumers pay $\$10 - \$9 = \$1.00$ less. Producers receive $\$10.50 - \$10 = \$0.50$ more. Check: $1.00 + 0.50 = 1.50$, which equals the subsidy.

Step 5: cost to the government. $\$1.50 \times 550 = \825 per day. Consumers' share = $\$1.00 \times 550 = \550 ; producers' share = $\$0.50 \times 550 = \275 . Check: $550 + 275 = 825$.

Interpretation: as with a tax, the less elastic side of the market (here, consumers) gets the larger share of the subsidy.

On a diagram: S shifts down by $\$1.50$ to $S + \text{subsidy}$. The new equilibrium is $\$9$ and 550 crates. The government spending rectangle has height from $\$9$ to $\$10.50$ and width 550. The part from $\$9$ to $\$10$ is the consumers' gain ($\$550$) and the part from $\$10$ to $\$10.50$ is the producers' gain ($\$275$).

Limitations: subsidies have an opportunity cost, since the money could have funded schools or hospitals. They are hard to remove once people depend on them. Inefficient firms may become reliant on them. If demand is price-inelastic, consumption rises only a little. Some of the benefit goes to producers rather than to the consumers the policy was aimed at.

2.5 Direct provision

The government produces the good itself or pays for it and supplies it free, or below cost, at the point of use. Examples are state schools, public hospitals, defence and street lighting. This is the main solution to the **public good** problem, because the free market will not supply those goods at all. It is also used for merit goods, so that consumption does not depend on ability to pay.

Limitations: it must be funded by taxation, which has an opportunity cost and may reduce incentives. With a zero price, demand exceeds supply, which leads to waiting lists and overcrowding. State providers may lack the profit motive and become inefficient. It is also hard to decide how much of a public good to provide, because people do not reveal how much they value it.

2.6 Regulation

Regulation means rules or laws that control the behaviour of consumers or firms. Breaking them is punished with fines, licence withdrawal or prosecution. Examples:

- Bans (on smoking in public buildings, on selling energy drinks to under-16s).
- Limits (maximum emissions from factories, noise limits at night).
- Compulsory consumption (school attendance up to a certain age, seat belts, vaccinations for school entry).
- Information rules that tackle information failure (health warnings on cigarette packs, calorie labels, disclosure rules for financial products).

Strengths: simple to understand, quick to put in place, and effective where the harm is severe and must be stopped completely.

Limitations: enforcement is costly and may be weak or corrupt. A ban can create an illegal market. A uniform limit ignores the fact that some firms can cut pollution more cheaply than others. Firms that meet a limit have no incentive to do better. Too much regulation raises firms' costs ("red tape").

2.7 Transfer payments

Transfer payment: a payment made by the government to an individual for which no good or service is provided in return. Examples: unemployment benefit, pensions, child benefit, cash grants to low-income families. Transfer payments redistribute income. They are not counted in GDP because they are not payment for current output.

Transfers can be **means-tested** (paid only to those below an income or wealth threshold, which targets help but can discourage people from earning more) or **universal** (paid to everyone in a group, which is simple and avoids stigma but is costly and partly goes to people who do not need it). Transfers can also be **conditional**, for example cash paid only if children attend school. This links equity with the consumption of merit goods.

2.8 Summary of micro methods

Method	What changes on the diagram	Best suited to	Main limitation
Maximum price	Horizontal line below P_e ; no curve shifts; shortage	Affordability of necessities	Shortage, black market
Minimum price	Horizontal line above P_e ; no curve shifts; surplus	Farm incomes, demerit goods, low wages	Surplus, cost of buying it, unemployment
Indirect tax	Supply shifts up (left) by the tax per unit	Demerit goods, negative externalities	Regressive; weak effect if demand is inelastic
Subsidy	Supply shifts down (right) by the subsidy per unit	Merit goods, positive externalities	Opportunity cost, dependency
Direct provision	Government supplies the quantity directly	Public goods, merit goods	Funding, inefficiency, excess demand
Regulation	Quantity limited or required by law	Severe harms, information failure	Enforcement cost, illegal markets
Transfer payments	Raise incomes of the poor; demand for the goods they buy (normal goods) shifts right	Inequality, poverty	Cost, disincentive effects

A Level extension (useful evaluation background): government failure

Government failure happens when intervention makes the allocation of resources worse, or creates new inefficiencies. Common causes are poor information (not knowing the true external cost), unintended consequences (black markets, smuggling), administrative costs, political pressure (choosing policies for votes) and time lags. At AS you can still use these points to evaluate a policy: weigh the size of the problem against the risk that the intervention goes wrong.

3. Addressing income and wealth inequality

Income: a flow of money received over a period of time (wages, rent, interest, profit, transfers).

Wealth: a stock of assets owned at a point in time (property, land, shares, savings).

Equity: fairness in the distribution of income and wealth. It is not the same as **equality**, which means everyone has the same.

Wealth is usually distributed more unequally than income. Wealth produces income (rent, dividends), and it can be passed on to the next generation.

Beyond AS (A Level topic): measuring inequality with the Lorenz curve and Gini coefficient

AS questions will not ask you to draw a Lorenz curve or calculate a Gini coefficient. This box is here for background only.

A **Lorenz curve** plots the cumulative percentage of households (poorest first) on the horizontal axis against the cumulative percentage of income they receive on the vertical axis. A 45° line shows perfect equality. The further the Lorenz curve bows below the 45° line, the greater the inequality.

The **Gini coefficient** = $A \div (A + B)$, where A is the area between the line of equality and the Lorenz curve, and B is the area under the Lorenz curve. It ranges from 0 (perfect equality) to 1 (one household has all the income).

Worked example 5: calculating a Gini coefficient. On a diagram where both axes run from 0 to 1, the total area under the line of equality is $\frac{1}{2} \times 1 \times 1 = 0.5$. Suppose area A = 0.19. Then $B = 0.5 - 0.19 = 0.31$, and $\text{Gini} = A \div (A + B) = 0.19 \div 0.5 = \mathbf{0.38}$. After a new set of taxes and transfers, area A falls to 0.16. New $\text{Gini} = 0.16 \div 0.5 = 0.32$. The distribution of income has become more equal.

3.1 Policies to redistribute income and wealth

Policy	How it reduces inequality	Possible drawback
Progressive income tax	Higher earners pay a higher proportion of their income	May reduce the incentive to work or to declare income; tax avoidance
Taxes on wealth (property tax, inheritance tax, capital gains tax)	Reduce the concentration of assets	Hard to value assets; capital may move abroad
Transfer payments (benefits, pensions, cash transfers)	Raise the incomes of the poorest	Costly; may create a poverty or unemployment trap
National minimum wage	Raises pay of the lowest-paid workers	May cause unemployment if set well above equilibrium; does not reach the informal sector
State provision of education and healthcare	Gives poor households access to services and raises their future earning power	Funding; quality may be low

Subsidies on necessities	Lower the cost of living for poor households	Poorly targeted: the rich also benefit
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Types of tax by incidence on income

Progressive tax: the proportion of income paid in tax rises as income rises (average rate rises).

Proportional tax: the same proportion of income is paid in tax at all income levels.

Regressive tax: the proportion of income paid in tax falls as income rises. Most indirect taxes are regressive in effect.

Average tax rate = total tax paid ÷ total income × 100. **Marginal tax rate** = the rate paid on the last (next) unit of income.

Worked example 6: a progressive income tax (invented bands)

Annual income band (Rs)	Tax rate on income in this band
0 – 600 000	0%
600 001 – 1 200 000	10%
above 1 200 000	25%

Person X earns Rs 900 000.

First 600 000 at 0% = Rs 0

Next 300 000 (900 000 – 600 000) at 10% = Rs 30 000

Total tax = Rs 30 000. Average rate = $30\,000 \div 900\,000 \times 100 = 3.33\%$. Marginal rate = 10%.

Person Y earns Rs 2 000 000.

First 600 000 at 0% = Rs 0

Next 600 000 at 10% = Rs 60 000

Remaining 800 000 (2 000 000 – 1 200 000) at 25% = Rs 200 000

Total tax = Rs 260 000. Average rate = $260\,000 \div 2\,000\,000 \times 100 = 13\%$. Marginal rate = 25%.

Conclusion: the average rate rises from 3.33% to 13% as income rises, so the tax is progressive.

4. Government macroeconomic policy: objectives and framework

Governments usually pursue four main macroeconomic objectives:

1. **Economic growth:** a sustained increase in real GDP.
2. **Low unemployment** (a high level of employment).
3. **Low and stable inflation**, often a target such as 2% or a range such as 5–7%.
4. **Balance of payments stability**, in particular avoiding a large, persistent current account deficit.

These objectives can **conflict**. Fast growth in aggregate demand (AD) reduces unemployment but can raise inflation and suck in imports, which worsens the current account. Policies are analysed using the

AD/AS model. Remember that $AD = C + I + G + (X - M)$.

Policy type	Mainly works through	Diagram effect	Time frame
Fiscal policy	Government spending (G) and taxation	Shifts AD	Short to medium term (demand-side)
Monetary policy	Interest rates, money supply, exchange rate	Shifts AD	Short to medium term (demand-side)
Supply-side policy	Quantity and quality of factors of production, incentives, competition	Shifts AS (LRAS) right	Mainly long term

5. Fiscal policy

Fiscal policy: the use of government spending and taxation to influence aggregate demand and the performance of the economy.

Budget deficit: government spending is greater than government revenue (mainly taxation) in a given year.

Budget surplus: government revenue (mainly taxation) is greater than government spending in a given year.

Balanced budget: government spending equals government revenue.

National debt: the total amount the government owes, built up from past deficits. A deficit is a flow; the national debt is a stock.

5.1 Tools

- **Government spending:** current spending (salaries of teachers and nurses) and capital spending (roads, dams, power stations).
- **Direct taxes:** taxes on income and wealth (income tax, corporation tax).
- **Indirect taxes:** taxes on spending (sales tax, excise duties).

Watch out: transfer payments (e.g. benefits and pensions) are government spending, but they are not counted in G in $AD = C + I + G + (X - M)$. They raise households' disposable income, so they affect AD through C.

Expansionary (reflationary) fiscal policy raises G and/or cuts taxes, which shifts AD to the right.

Contractionary (deflationary) fiscal policy cuts G and/or raises taxes, which shifts AD to the left.

Discretionary fiscal policy is a deliberate change in spending or tax rates. **Automatic stabilisers** change without any new decision. In a downturn, income-tax revenue falls and unemployment-benefit spending rises automatically, which cushions the fall in AD. In a boom the opposite happens.

Worked example 7: budget balance

A government plans to spend \$480 billion and expects revenue of \$435 billion (all from taxes, to keep it simple). Nominal GDP is \$1 500 billion.

Budget balance = revenue – spending = $435 - 480 = -\$45$ billion, a **deficit of \$45 billion**.

As a percentage of GDP: $45 \div 1\,500 \times 100 = 3\%$.

If the national debt was \$900 billion at the start of the year, and the deficit is financed entirely by borrowing, it rises to $900 + 45 = \$945$ billion, which is $945 \div 1\,500 \times 100 = 63\%$ of GDP.

5.2 Effects of expansionary fiscal policy

Variable	Likely effect	Explanation
Real output (GDP)	Rises	Higher G, or higher C after tax cuts, shifts AD right, so firms produce more
Employment	Rises / unemployment falls	Labour is a derived demand; more output needs more workers
Inflation	Rises, more so near full capacity	When the economy is near full employment, AS is steep, so most of the AD increase shows up as a higher price level
Current account	Likely to worsen	Higher incomes raise spending on imports; higher domestic inflation makes exports less competitive

Diagram in words: AD shifts from AD_1 to AD_2 . If the economy starts with a lot of spare capacity (the flat part of AS), real GDP rises a lot and the price level hardly changes. If it starts near full employment (the steep part), real GDP rises only a little and the price level rises a lot.

5.3 Limitations of fiscal policy

- **Time lags:** it takes time to recognise the problem, pass a budget and complete projects. By then the economic cycle may have turned.
- **Budget deficits and debt:** expansion raises borrowing and interest payments, which may force tax rises later.
- **Crowding out:** government borrowing may push up interest rates and reduce private investment.
- **Consumer behaviour:** people may save a tax cut instead of spending it, especially if confidence is low or they expect future tax rises.
- **Imports:** in a very open economy much of the extra spending leaks abroad.
- **Disincentives:** higher tax rates may reduce the incentive to work and invest.
- **Political pressure:** it is easier to raise spending than to cut it, and budgets may be timed around elections.
- **Informal economy:** a narrow tax base limits how much revenue the government can raise.

6. Monetary policy

Monetary policy: the use of interest rates, the money supply and the exchange rate to influence aggregate demand and the economy. In most countries it is run by the central bank, often with an inflation target.

6.1 Tools

- **Interest rates:** the central bank's policy rate influences the rates commercial banks charge borrowers and pay savers.

- **Money supply:** the central bank can increase the money supply, for example by buying government bonds from banks and other financial institutions (**quantitative easing**), or it can restrict bank lending through reserve requirements.
- **Exchange rate:** the central bank can buy or sell its own currency in the foreign exchange market to influence the currency's value. Changes in interest rates also affect the exchange rate.

6.2 How a cut in interest rates works (transmission)

1. Borrowing becomes cheaper, so households borrow more for cars, homes and consumer durables, and C rises.
2. Saving becomes less rewarding, so households save less and spend more, and C rises.
3. Borrowers on variable-rate loans pay less interest, which raises their disposable income, so C rises.
4. Firms' cost of borrowing falls, so more investment projects become profitable and I rises.
5. Lower interest rates reduce the return on deposits held in the currency, so fewer foreign funds flow in and the currency tends to depreciate. Exports become cheaper abroad and imports dearer at home, so $(X - M)$ rises.
6. AD shifts right, and real GDP and employment rise. Inflation may rise, especially near full capacity.

A **rise** in interest rates works the other way. It is the standard response when inflation is above target.

Worked example 8: real interest rates

The central bank's policy rate is 12% and inflation is 9%.

Real interest rate $\approx$ nominal rate – inflation rate = $12\% - 9\% = 3\%$.

If inflation rises to 14% and the policy rate stays at 12%, the real rate becomes $12\% - 14\% = -2\%$. Savers now lose purchasing power, borrowing is effectively cheap, and monetary policy has become *looser* even though the nominal rate did not change.

6.3 Effects of contractionary monetary policy (higher interest rates)

Variable	Likely effect	Explanation
Real output	Falls, or grows more slowly	C and I fall, so AD shifts left
Employment	Falls / unemployment rises	Lower output needs fewer workers
Inflation	Falls	Lower AD reduces demand-pull pressure; appreciation makes imports cheaper
Current account	Uncertain	Lower incomes reduce imports (improves the balance), but a stronger currency makes exports dearer and imports cheaper (worsens the balance)

6.4 Limitations of monetary policy

- **Time lags:** an interest-rate change may take many months to have its full effect on spending and inflation.
- **Low confidence:** in a deep recession, firms and households may not borrow even at very low rates. Rates also cannot easily be cut much below zero.
- **Cost-push inflation:** if inflation comes from higher oil or import prices, raising rates reduces output and jobs but does not remove the cause.
- **Side effects:** high rates hurt borrowers and investment, which can reduce long-run growth, and they raise the government's interest bill.
- **Weak transmission:** where many people do not use banks, or much borrowing is informal, interest-rate changes have less effect.
- **Hot money and the exchange rate:** large capital flows may move the currency in ways that conflict with other objectives.

7. Supply-side policy

Supply-side policy: policies designed to increase the productive capacity of the economy, and its efficiency, by improving the quantity and quality of factors of production and the incentives to use them. The aim is to shift the long-run aggregate supply (LRAS) curve to the right.

7.1 Tools

Tool	Type	How it raises productive capacity
Spending on education and training	Interventionist	Raises labour productivity and skills; reduces structural unemployment
Spending on infrastructure (roads, ports, power, internet)	Interventionist	Cuts firms' costs and makes investment more attractive
Subsidies or tax relief for research and development	Interventionist	Encourages innovation and new technology
Cuts in income tax and corporation tax	Market-based	Increases the incentive to work, invest and start businesses
Privatisation	Market-based	The profit motive may make firms more efficient
Deregulation	Market-based	Removes barriers to entry, which increases competition and efficiency
Labour market reforms (e.g. reducing trade union power, reforming benefits)	Market-based	Makes wages and hours more flexible; increases the incentive to take jobs

7.2 Effects

Diagram in words: LRAS (or AS) shifts from AS_1 to AS_2 . With AD unchanged, real GDP rises and the price level falls. If AD is also rising, supply-side policy allows output to grow without the price level rising as fast. This is **non-inflationary growth**.

Variable	Likely effect
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Real output	Rises: higher potential output, sustainable growth
Employment	Rises in the long run as structural unemployment falls (in the short run, privatisation may cut jobs)
Inflation	Falls, or is kept low, because productive capacity grows and costs fall
Current account	Improves in the long run: lower costs and better quality make exports more competitive and reduce reliance on imports

In principle, supply-side policy can help all four objectives at once without the trade-offs that demand-side policies face, because it raises capacity rather than just demand. That is why it is attractive. In practice the gains are slow and uncertain, some measures cost jobs or widen inequality in the short run (see 7.3), and the higher incomes that come with growth can still pull in more imports.

7.3 Limitations of supply-side policy

- **Long time lags:** education reforms may take 10–20 years to raise productivity.
- **Cost:** interventionist policies need large government spending, which has an opportunity cost and may increase the deficit.
- **Uncertain response:** tax cuts may not raise work effort. Some people may choose more leisure instead.
- **Equity:** cutting top tax rates, benefits or union power may widen inequality.
- **Short-run costs:** privatisation and deregulation can lead to job losses, private monopolies, or weaker safety and environmental standards.
- **No help in a recession:** if the problem is too little AD, adding capacity does little in the short run.

8. Comparing the three policies and policy conflicts

Criterion	Fiscal policy	Monetary policy	Supply-side policy
Main curve affected	AD	AD	AS / LRAS
Speed	Slow to agree, fairly direct once in place	Quick to change, slow to take full effect	Slowest
Who decides	Government (finance ministry)	Usually the central bank	Government
Can it be targeted at regions or groups?	Yes	No: one interest rate for everyone	Yes
Main trade-off	Growth vs inflation, current account and debt	Inflation vs growth and jobs	Long-run gain vs short-run cost and inequality

Common conflicts to discuss:

- **Low unemployment vs low inflation:** expanding AD creates jobs but may raise inflation.
- **Growth vs the current account:** faster growth raises imports.
- **Low inflation vs growth:** higher interest rates reduce inflation but also slow investment and

growth.

- **Growth vs equality or the environment:** supply-side tax cuts and deregulation may widen inequality and increase pollution.

A policy mix is often used. For example, a government may pair a tight monetary policy (to control inflation) with supply-side policy (to support long-run growth).

Key terms

Term	Definition
Market failure	When the free market allocates resources inefficiently, so society's welfare is not maximised
Merit good	A good more beneficial to the consumer than the consumer realises; under-consumed in a free market
Demerit good	A good more harmful to the consumer than the consumer realises; over-consumed in a free market
Public good	A good that is non-excludable and non-rival
Free rider	Someone who benefits from a good without paying for it
Externality	A cost or benefit to a third party not reflected in the market price
Information failure	When market participants lack the information needed to make rational decisions
Asymmetric information	When one party to a transaction has more information than the other
Maximum price	A legal price ceiling set below equilibrium; creates a shortage
Minimum price	A legal price floor set above equilibrium; creates a surplus
Specific tax	A fixed amount of tax per unit sold
Ad valorem tax	A tax charged as a percentage of the price
Incidence of tax	How the burden of a tax is shared between consumers and producers
Subsidy	A government payment that lowers the cost of production or the price paid
Transfer payment	A payment by the government for which no good or service is provided in return
Progressive tax	A tax where the proportion of income paid rises as income rises
Regressive tax	A tax where the proportion of income paid falls as income rises
Fiscal policy	Use of government spending and taxation to influence AD and the economy
Budget deficit	Government spending greater than government revenue (mainly taxation) in a year
Automatic stabilisers	Tax revenues and spending that change automatically with the economic cycle, reducing fluctuations in AD
Monetary policy	Use of interest rates, the money supply and the exchange rate to influence AD and the economy

Quantitative easing	A central bank buying financial assets, such as government bonds, with newly created money to increase the money supply
Supply-side policy	Policies that increase the economy's productive capacity and efficiency, shifting LRAS right
Government failure (A Level)	When government intervention makes resource allocation worse
Gini coefficient (A Level)	A measure of inequality from 0 (perfect equality) to 1 (complete inequality), equal to $A \div (A + B)$ on a Lorenz diagram

Quick check

Multiple choice (Paper 1 style)

1. A government sets a maximum price for rice **above** the equilibrium price. What is the effect?
A a shortage of rice
B a surplus of rice
C no change in the price or quantity traded
D a black market in rice [1]
2. Before a specific tax of \$3 per unit, a market clears at \$20 and 100 units. After the tax, consumers pay \$22 and 80 units are sold. What is the government's tax revenue?
A \$300
B \$240
C \$160
D \$80 [1]
3. Demand for a good is perfectly price-inelastic. A specific tax of \$2 per unit is imposed. Which statement is correct?
A The price paid by consumers rises by \$2.
B Producers bear the whole tax.
C Consumers and producers each pay \$1 per unit.
D The quantity traded falls. [1]
4. Which item of government spending is counted in G in $AD = C + I + G + (X - M)$?
A unemployment benefit
B state pensions
C salaries of teachers in state schools
D interest paid on the national debt [1]

Short and extended questions

1. **Define** a public good. [2]
2. **State** two differences between a merit good and a good with a positive externality of consumption. [2]
3. **Identify** which type of tax (progressive, proportional or regressive) is described: a household earning \$20 000 pays \$1 000 in tax, and a household earning \$50 000 pays \$2 000. [1]
4. Demand is $Q_d = 300 - 5P$ and supply is $Q_s = -60 + 7P$. **Calculate** the equilibrium price and quantity, and the shortage created by a maximum price of \$25. [4]

5. Before a tax, a market clears at \$6 and 1 200 units. After a specific tax of \$2 per unit, consumers pay \$7.50 and 1 000 units are sold. **Calculate** (a) the total tax revenue [1] and (b) the share of the tax paid by consumers and by producers [3].
6. Using the answer to Question 5, **explain** what the incidence suggests about the relative price elasticities of demand and supply. [2]
7. A government spends \$260 billion and collects \$275 billion in taxes. GDP is \$1 250 billion. **Calculate** the budget balance as a percentage of GDP and state whether it is a surplus or deficit. [2]
8. **Explain** why a free market is unlikely to provide street lighting. [3]
9. **Explain** how a rise in the central bank's interest rate could reduce inflation. [4]
10. **Analyse** how an increase in government spending on infrastructure could affect the current account of the balance of payments in the short run and in the long run. [6]
11. **Assess** whether a maximum price is the best way to make a staple food affordable for low-income households. [8]
12. Country Z has an unemployment rate of 11%. Much of it is among young people who lack technical skills, and real GDP has also fallen for two years in a row. **Evaluate** whether supply-side policy would be more effective than fiscal policy in reducing unemployment in Country Z. [12]

Answers: multiple choice

MC1: C. A maximum price above equilibrium does not bind, so the market stays at its equilibrium. A is wrong: a shortage needs the ceiling to be below equilibrium. B is wrong: a surplus comes from a price floor above equilibrium. D is wrong: there is no shortage, so there is no reason for a black market.

MC2: B. Revenue = tax per unit $\times$ new quantity = $\$3 \times 80 = \240 . A is wrong: it uses the old quantity (3×100). C is wrong: \$160 is only the consumers' share ($\$2 \times 80$). D is wrong: \$80 is only the producers' share ($\$1 \times 80$).

MC3: A. Quantity demanded does not respond to price, so producers can pass on the whole tax, and the price rises by the full \$2. B is wrong: producers bear all the tax only when demand is perfectly elastic. C is wrong: an equal split needs equal elasticities, not perfectly inelastic demand. D is wrong: with perfectly inelastic demand, the quantity traded does not change.

MC4: C. Teachers' salaries pay for a service produced now, so they count in G. A, B and D are wrong: benefits, pensions and debt interest are transfer payments. No output is produced in return, so they are not in G; they affect AD through C when households spend them.

Answers: short and extended questions

1. A good that is non-excludable [1], meaning non-payers cannot be prevented from benefiting, and non-rival [1], meaning one person's use does not reduce the amount available to others.

2. Any two: a merit good is under-consumed because the *consumer* underestimates their own benefit (information failure), while a positive externality is a benefit to a *third party* [1]. Merit goods involve a value judgement about what is good for people; externalities are about the gap between private and social benefit [1]. A good can be one without the other.

3. Regressive. The first household pays $1\,000 \div 20\,000 = 5\%$; the second pays $2\,000 \div 50\,000 =$

4%. The proportion falls as income rises. [1]

4. $300 - 5P = -60 + 7P \rightarrow 360 = 12P \rightarrow P = \30 [1]. $Q = 300 - 5(30) = 150$ [1]. At \$25: $Q_d = 300 - 125 = 175$ and $Q_s = -60 + 175 = 115$ [1]. Shortage = $175 - 115 = 60$ units [1].

5. (a) Revenue = $\$2 \times 1\,000 = \$2\,000$ [1]. (b) Consumers pay $\$7.50 - \$6.00 = \$1.50$ more per unit [1]. Producers keep $\$7.50 - \$2 = \$5.50$, which is $\$0.50$ less per unit than before [1]. Totals: consumers $\$1.50 \times 1\,000 = \$1\,500$ and producers $\$0.50 \times 1\,000 = \500 [1]. *Tip (no mark):* check that the two shares add up to the revenue: $1\,500 + 500 = 2\,000$.

6. Consumers bear three-quarters of the tax [1]. The side bearing more of the tax is the less price-elastic side, so demand is less price-elastic than supply in this market [1].

7. Balance = $275 - 260 = +\$15$ billion, a surplus [1]. $15 \div 1\,250 \times 100 = 1.2\%$ of GDP [1].

8. Street lighting is non-excludable: once a street is lit, a firm cannot stop people who have not paid from using the light [1]. So people have an incentive to free ride and will not pay voluntarily [1]. A private firm cannot earn enough revenue to cover its costs, so it will not supply the good, and the market is missing [1]. (Non-rivalry may also be mentioned.)

9. Higher interest rates make borrowing dearer and saving more attractive, so consumption falls [1]. Firms' cost of borrowing rises, so investment falls [1]. Higher rates may attract capital inflows and cause the currency to appreciate, which lowers import prices and reduces net exports [1]. AD shifts left, reducing demand-pull pressure, so the rate of inflation falls [1].

10. *Short run:* infrastructure spending is an injection that shifts AD right and raises incomes [1]. Some of the extra income is spent on imports, and the projects may need imported materials and machinery, so imports rise [1]. If AD rises near full capacity, domestic inflation may make exports less competitive [1]. So the current account is likely to worsen at first [1]. *Long run:* better roads, ports and power reduce firms' costs and raise productivity, which shifts LRAS right [1]. Exports become more price-competitive and domestic firms can replace some imports, so the current account may improve. The outcome depends on how much of the spending goes on imports and how efficiently the projects are carried out [1].

11. Levels guide [8]

- **Level 3 (6–8):** accurate analysis of both the benefits and the problems of a maximum price, linked to a clearly explained diagram, compared with at least one alternative, and a justified judgement that depends on stated conditions.
- **Level 2 (3–5):** some correct analysis, but one-sided or with limited diagram use; evaluation is brief or unsupported.
- **Level 1 (1–2):** mostly descriptive, with few links between cause and effect.

Indicative content. For: a maximum price below equilibrium directly lowers the price that low-income households pay. It is simple and visible, and it costs the government little because no spending is needed. *Against:* it creates a shortage, because quantity demanded rises while quantity supplied falls. Some poor households may get nothing at all, since the food is rationed by queues or favouritism. A black market may develop, with prices above the free-market level. Farmers' incomes fall, which may reduce supply further in the long run. *Alternatives:* a subsidy to producers lowers the price while increasing supply, though it has an opportunity cost. Targeted cash transfers or food vouchers help only the poor, but they need administration. *Judgement:* a maximum price may help in the short run if supply is price-inelastic, because the shortage is then

smaller. A targeted subsidy or transfer is usually more effective because it does not create a shortage. The best choice depends on the government's budget and its ability to identify poor households.

12. Levels guide [12]

- **Level 3 (9–12):** accurate analysis of how both policies affect unemployment, using AD/AS diagrams and distinguishing types of unemployment; the answer uses the information about Country Z; a justified conclusion that states the conditions it depends on.
- **Level 2 (5–8):** sound analysis of one policy, or weaker analysis of both; some evaluation, but general or not linked to Country Z.
- **Level 1 (1–4):** mainly descriptive; points listed with little explanation of how they reduce unemployment.

Indicative content. Fiscal policy: falling real GDP suggests cyclical (demand-deficient) unemployment. Higher G or lower taxes shifts AD right, output rises, and firms hire more workers. Spending can be targeted at young people or high-unemployment regions. Limitations: time lags, a larger deficit and debt, leakage into imports, and possible inflation if the economy is near capacity. It does little for structural unemployment caused by a skills mismatch. *Supply-side policy:* training and technical education tackle the skills gap among young people by matching skills to vacancies, and benefit reform and flexible labour markets reduce frictional and voluntary unemployment. It can lower unemployment without raising inflation. Limitations: long time lags, high cost, and possible short-run job losses from privatisation; extra skills do not create jobs if AD is too low. *Judgement:* Country Z seems to have both types of unemployment. Fiscal policy is likely to work faster on the cyclical part, and supply-side policy is needed for the structural part among young people. A combination is probably best, and the balance depends on the government's budget position and on how much of the 11% is cyclical rather than structural.

Mark allocations and levels guides are indicative. For the longer answers, credit is given for clear analysis linked to diagrams and for a supported judgement, not for listing points.