

Cambridge AS & A Level · Economics 9708 · Notes

# Methods and effects of government intervention in markets

AS

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## What you need to know

By the end of this topic you should be able to explain how each of these six methods works, draw it on a demand and supply diagram, and weigh up its effects:

1. **Specific indirect taxes:** a fixed amount of tax on each unit sold. Show the effect on supply, price, quantity and tax revenue, and explain the **incidence**: how the burden is split between consumers and producers, and how that depends on price elasticity of demand (PED) and of supply (PES).
2. **Subsidies:** a payment per unit to producers. Show the effect on supply, price and quantity, the cost to the government, and the incidence: how the benefit is split between consumers and producers.
3. **Direct provision of goods and services:** the government supplies the good itself, often free or below cost, paid for out of taxes.
4. **Maximum and minimum prices:** a legal ceiling below the equilibrium price or a legal floor above it, and the shortages, surpluses and other effects they cause.
5. **Buffer stock schemes:** an agency buys and stores a product when its price would fall below a floor and sells from its stock when the price would rise above a ceiling.
6. **Provision of information:** telling people the true benefits of merit goods or the true harm of demerit goods, so that demand changes.

"Effects" means effects on consumers, producers, the government and the allocation of resources. Why governments intervene is the previous topic.

## Understand it

### Two kinds of method

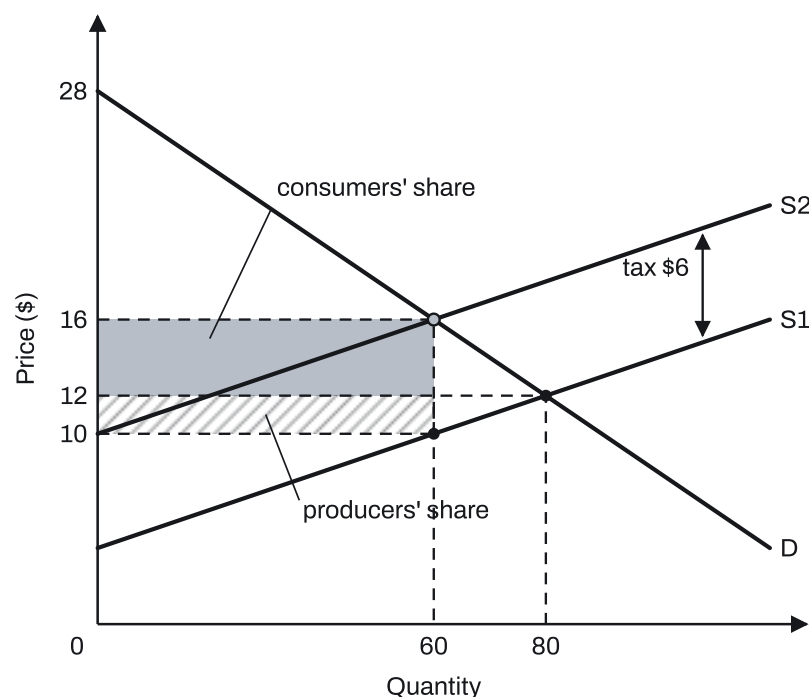
Some methods work through **supply**: a tax raises firms' costs and a subsidy lowers them, so the supply curve shifts. Others work through **demand**: information changes what people want to buy. Price controls do neither; they stop the price from reaching equilibrium. Direct provision and buffer stocks put the government into the market as a seller or a buyer.

This matters in multiple-choice questions: **only provision of information shifts demand**. Taxes and subsidies shift supply.

### Specific indirect taxes

An **indirect tax** is a tax on spending, collected from the seller; a **direct tax** is a tax on income or wealth. A **specific** (unit) tax is a fixed amount per unit, such as \$6 a unit. An **ad valorem** tax is a percentage of the price, such as 20% sales tax.

The firm must hand \$6 to the government for every unit it sells, so to supply any quantity it now needs \$6 more per unit. The supply curve moves **up by the tax at every quantity**: a parallel shift for a specific tax. An ad valorem tax takes more when the price is higher, so it pivots the supply curve and the gap widens as price rises.



Here demand is  $P = 28 - \frac{Q}{5}$  and supply is  $P = 4 + \frac{Q}{10}$ , so the market starts at \$12 and 80 units. With the tax, supply becomes  $P = 10 + \frac{Q}{10}$  and the new equilibrium is \$16 and 60 units. The effects:

- **Price rises, but by less than the tax:** from \$12 to \$16, a rise of \$4, not \$6.

- **Quantity falls:** from 80 to 60, so the good is consumed less (useful for a demerit good).
- **Producers receive less:** they get \$16, hand \$6 to the government and keep \$10, which is \$2 less than before.
- **The government gains revenue:** tax per unit  $\times$  new quantity =  $6 \times 60 = \$360$ .
- **Consumer and producer surplus both fall.**

**Incidence** is who actually bears the tax. The firm hands it over (the first, legal impact of the tax is on the seller), but part is passed on in a higher price. Here consumers bear \$4 of each \$6 (\$240 of the revenue, two thirds) and producers bear \$2 (\$120, one third).

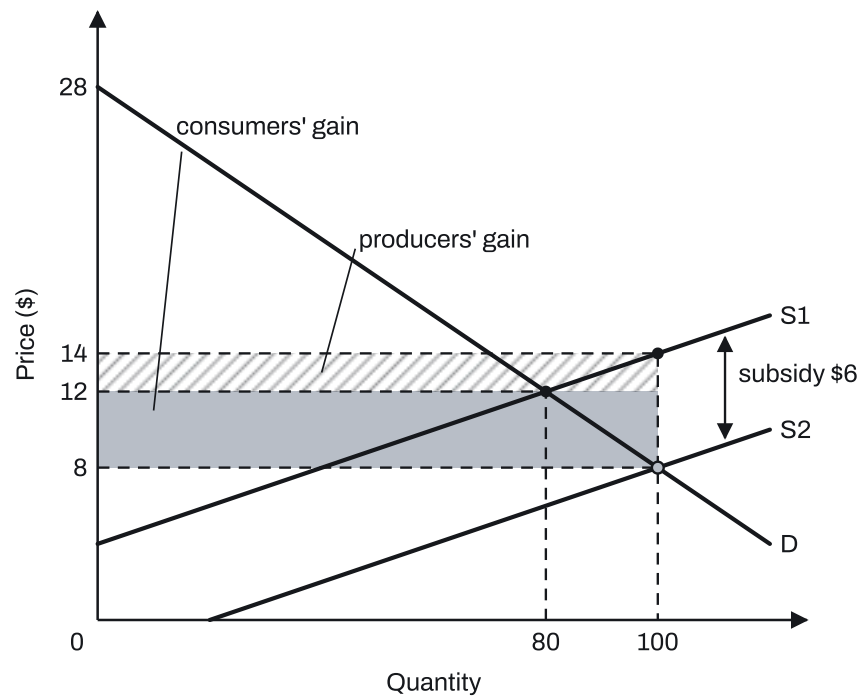
**The less elastic side bears more of the tax.** Consumers bear more when demand is price inelastic (they keep buying even as the price rises, so firms can pass the tax on) or supply is elastic. Producers bear more when demand is elastic (a price rise loses many sales, so firms must absorb the tax) or supply is inelastic. The extreme cases:

| Situation                               | Price rise    | Who bears the tax    |
|-----------------------------------------|---------------|----------------------|
| Demand perfectly inelastic (PED = 0)    | the whole tax | consumers, all of it |
| Supply perfectly elastic (PES infinite) | the whole tax | consumers, all of it |
| Demand perfectly elastic (PED infinite) | none          | producers, all of it |
| Supply perfectly inelastic (PES = 0)    | none          | producers, all of it |

With inelastic demand a tax **raises a lot of revenue** but **cuts consumption only a little**: the central trade-off for taxes on demerit goods such as cigarettes. Indirect taxes are also **regressive**: they take a larger share of a poor household's income than a rich one's.

## Subsidies

A **subsidy** is a payment from the government to producers, usually a fixed amount per unit. It is not a loan and is never paid back. It lowers the firm's cost of supplying each unit, so the supply curve moves **down (to the right) by the subsidy at every quantity**.



With the same market and a \$6 subsidy, supply becomes  $P = \frac{Q}{10} - 2$  and the new equilibrium is \$8 and 100 units:

- **Price falls by less than the subsidy** (by \$4) and **quantity rises** (from 80 to 100).
- **Producers receive more per unit:** \$8 from the buyer plus \$6 from the government, \$14, which is \$2 more than before. Their total revenue includes the subsidy:  $14 \times 100 = \$1400$ .
- **The government pays** subsidy per unit  $\times$  new quantity  $= 6 \times 100 = \$600$ . This money has an **opportunity cost**: it could have been spent on something else, or it must be raised by taxes or borrowing.
- **Consumer surplus and producer surplus both rise.**

The **incidence of a subsidy** is how the \$6 is shared: consumers gain \$4, producers \$2. As with a tax, **the less elastic side gets more of it**. If demand is perfectly inelastic, the price falls by the whole subsidy, all the gain goes to consumers, and the quantity does not change at all. The quantity bought rises most, and so the cost to the government is largest, when demand and supply are both elastic; when both are inelastic, sales barely rise and the subsidy costs least.

Subsidies are used to cut the price of merit goods (so more is consumed), to raise farmers' incomes without raising food prices, and to keep essentials such as electricity or fuel cheap. The risks: the cost to the government, firms keeping it as profit, firms becoming inefficient, and, for a merit good, consumption may barely rise because the subsidy does nothing about imperfect information.

## Direct provision of goods and services

**Direct provision** means the government (or a state-owned body) supplies the good or service itself: state schools, public hospitals, a government library, road maintenance, state-owned electricity companies. It is paid for mostly from taxes and is often free at the point of use.

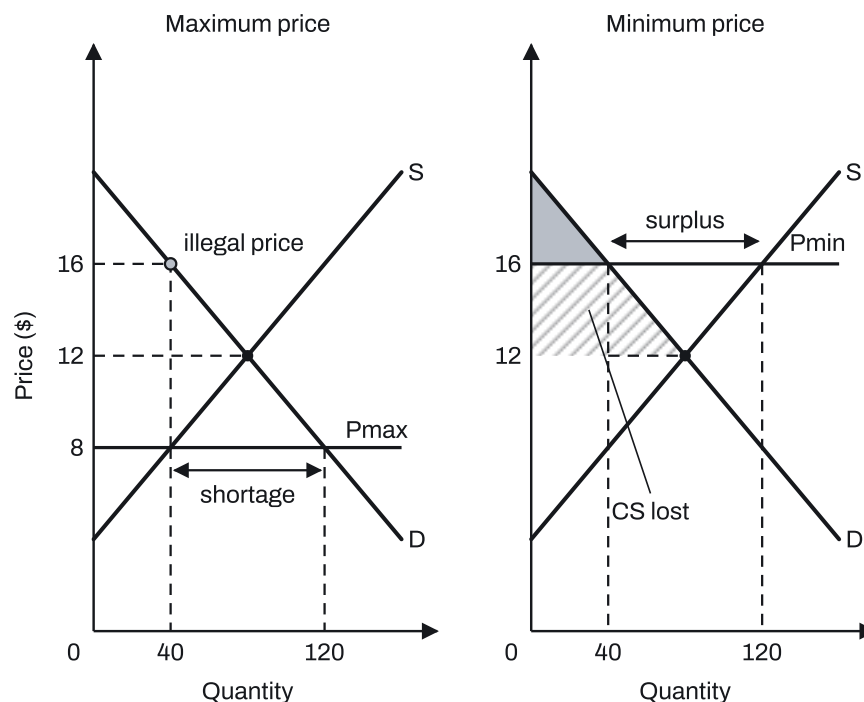
It is **not** direct provision when the government pays a private firm (a subsidy), gives people money (a transfer payment), sets a price (a price control), or when a charity or private firm provides the service.

Effects:

- **For:** consumption of merit goods and essential services rises, so under-consumption caused by imperfect information and low incomes falls; everyone can use it, whatever their income (**equity**); public goods get provided; a state body may act in the national interest rather than for profit.
- **Against:** a high **opportunity cost** (tax money not spent elsewhere) and higher taxes; at a zero price, quantity demanded may exceed what can be supplied, giving **queues and waiting lists**, and people may over-use it; with no profit motive and no competition there is less incentive to keep costs down and quality up, so it can be **inefficient**; it can **crowd out** private providers, who cannot compete with a free service; the government may not know how much people need (**government failure**).

## Maximum prices

A **maximum price** (price ceiling) is a legal upper limit. It only has an effect if it is set **below** the equilibrium price; a maximum above equilibrium changes nothing, because the market price is already lower.



Here demand is  $P = 20 - \frac{Q}{10}$  and supply is  $P = 4 + \frac{Q}{10}$ , with equilibrium at \$12 and 80 units. At a maximum price of \$8:

- **Demand extends** to 120 (the good is cheaper) and **supply contracts** to 40 (producing is less profitable), so there is a **shortage** (excess demand) of  $120 - 40 = 80$ . Fewer units are actually bought (40) than before (80).
- **The good must be rationed** some other way: queues, waiting lists, ballots, ration coupons, or sellers choosing customers.

- **Illegal (black) markets** appear: for the 40 units that exist, some buyers would pay up to \$16 (read up from 40 to the demand curve), so people who get the good at \$8 can resell it for more.
- **Quality may fall**, and in the long run firms may leave, making the shortage worse.
- **Who gains?** Consumers who manage to buy pay less; those who cannot buy lose out; producers lose revenue and producer surplus; policing the law costs money.

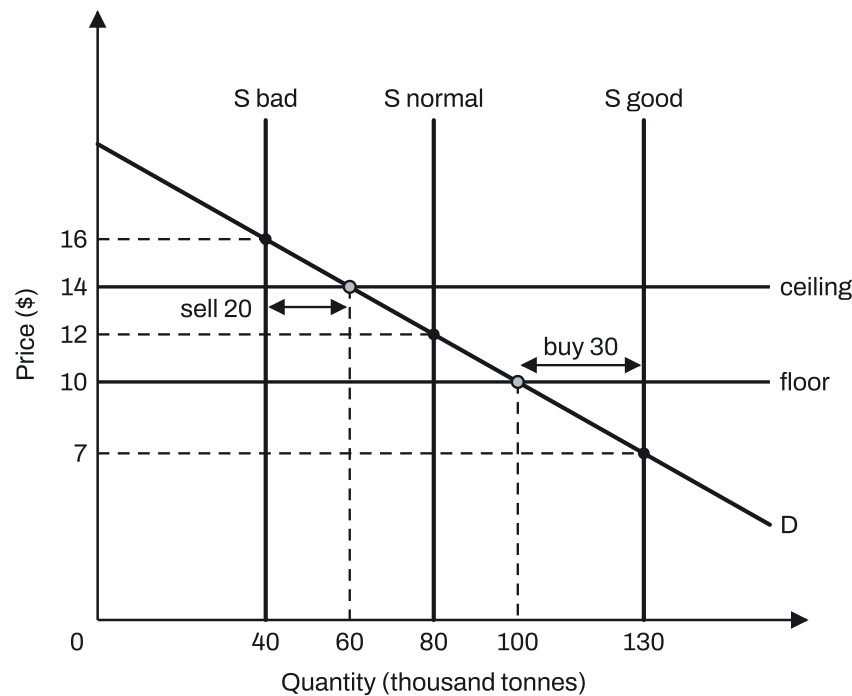
## Minimum prices

A **minimum price** (price floor) is a legal lower limit. It only has an effect if it is set **above** equilibrium. At \$16 in the right-hand diagram:

- **Supply extends** to 120 and **demand contracts** to 40, so there is a **surplus** (excess supply) of  $120 - 40 = 80$ .
- **Consumers pay more and buy less.** Consumer surplus (the difference between what consumers are willing to pay and what they actually pay) falls, because the consumers who still buy pay \$4 more for each unit and the others stop buying altogether. It falls from  $\frac{1}{2} \times 80 \times 8 = \$320$  to  $\frac{1}{2} \times 40 \times 4 = \$80$ , a loss of \$240. The fall is largest when demand is price inelastic, because consumers keep buying at the higher price.
- **Producers get a higher price for each unit they sell**, but sell only 40 unless someone buys the rest.
- **What happens to the surplus?** For farm products, the government usually promises to buy it, to protect farmers' incomes. That costs  $\text{price} \times \text{surplus} = 16 \times 80 = \$1280$ , plus storage, and the stock may be wasted or dumped abroad. For a demerit good such as alcohol, the government does **not** buy the surplus: the aim is to cut consumption, and buying it would be costly.
- **Uses:** guaranteeing producers' incomes (farmers), cutting consumption of a demerit good (a minimum price per unit of alcohol), and, for labour, a minimum wage.
- **Problems:** surpluses and their cost, firms stay inefficient because the price is guaranteed, and illegal selling below the minimum.

## Buffer stock schemes

Farm prices swing because harvests depend on the weather. A **buffer stock scheme** holds the price between a **floor** and a **ceiling**: a minimum price and a maximum price run together by an agency that holds a stock of the product.



Demand is  $P = 20 - \frac{Q}{10}$  and the harvest is fixed each year (a vertical supply curve):

- **Normal harvest (80):** the price is \$12, inside the band, so the agency does nothing.
- **Good harvest (130):** the price would fall to \$7. The agency **buys** the difference between the harvest and what consumers want at the floor,  $130 - 100 = 30$  thousand tonnes, and stores it. That costs  $30 \times 10 = \$300$  thousand. Taking supply off the market holds the price at \$10.
- **Bad harvest (40):** the price would rise to \$16. The agency **sells**  $60 - 40 = 20$  thousand tonnes from its store, adding to supply and holding the price at \$14.

**Benefits:** stable prices for consumers; stable incomes for farmers, who can plan and invest; food security, because stocks are there for bad years. During plentiful harvests the scheme mainly protects **growers**; during poor harvests it mainly protects **consumers**.

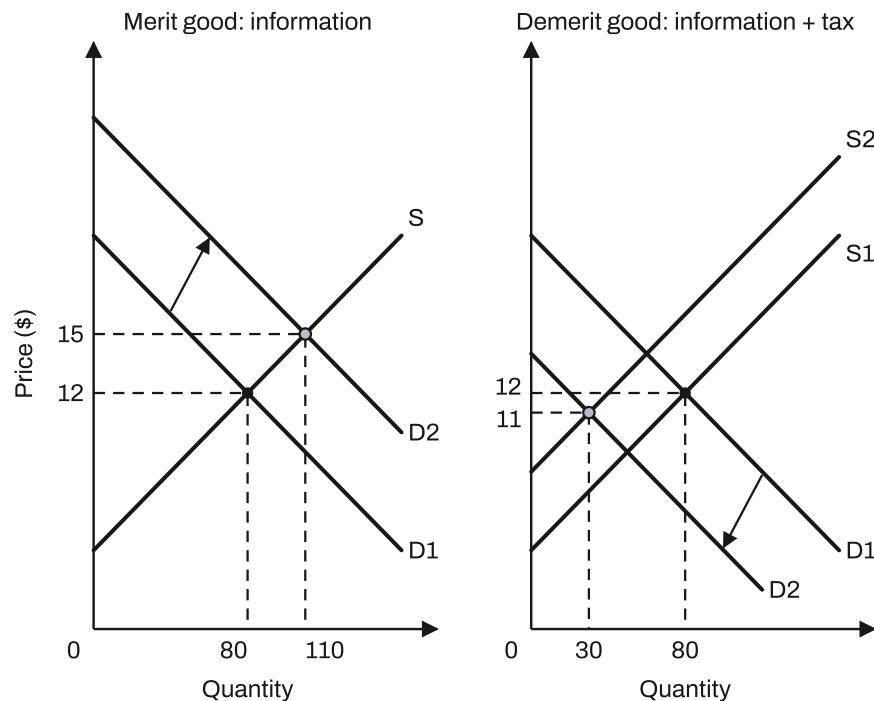
#### Problems:

- **Storage:** it only works for goods that are **cheap to store and not perishable** (grain, coffee beans, not fresh fruit).
- **Running out of money:** a floor set too high, or good harvests year after year, mean the agency keeps buying stock it cannot sell. A scheme lasts longest when storage is cheap, demand is rising and it is **hard for new producers to start** growing the crop (otherwise the guaranteed floor attracts more supply).
- **Running out of stock** after several bad harvests, so the ceiling cannot be held.
- **Setting the band** needs the long-run equilibrium price; there are also administration costs and illegal markets.

A related policy is to guarantee farmers' **incomes**: when a good harvest makes the price and farmers' total revenue fall, the government pays the difference between the target income and what farmers earn.

## Provision of information

Merit goods are under-consumed and demerit goods over-consumed because people have **imperfect information**. Providing information (campaigns, health warnings on packets, food labels, lessons in schools) tackles that cause directly. It works on **demand**: information about the benefits of a merit good shifts demand **right**; information about the harm of a demerit good shifts demand **left**.



When information is combined with a tax on a demerit good, both curves shift left: the quantity falls for certain (here from 80 to 30), but the price may rise or fall depending on which shift is larger (here it ends at \$11).

**For:** it deals with the cause, not the symptom; it is usually cheap compared with a subsidy or direct provision; it leaves people free to choose. **Against:** it works slowly; people may ignore it, not believe it, or, for addictive goods, be unable to change; campaigns cost money; and the government itself may have imperfect information.

## Key facts and formulas

There is no formula list in the exam for 9708, so every line is "Learn it".

| Formula or fact                                                                                     | Status   |
|-----------------------------------------------------------------------------------------------------|----------|
| Specific tax: supply shifts <b>up</b> by the tax per unit (parallel); ad valorem tax: supply pivots | Learn it |
| Subsidy: supply shifts <b>down</b> by the subsidy per unit                                          | Learn it |

| Formula or fact                                                                                                                   | Status   |
|-----------------------------------------------------------------------------------------------------------------------------------|----------|
| Tax revenue = tax per unit $\times$ quantity after the tax                                                                        | Learn it |
| Consumers' share of a tax per unit = new price – old price                                                                        | Learn it |
| Producers' share of a tax per unit = old price – (new price – tax)                                                                | Learn it |
| Government spending on a subsidy = subsidy per unit $\times$ quantity after the subsidy                                           | Learn it |
| Consumers' gain from a subsidy per unit = old price – new price; producers' gain = (new price + subsidy) – old price              | Learn it |
| The less elastic side (demand or supply) bears more of a tax and gets more of a subsidy                                           | Learn it |
| Shortage at a maximum price = $Q_d - Q_s$ ; surplus at a minimum price = $Q_s - Q_d$                                              | Learn it |
| Cost of buying up a surplus = minimum price $\times$ surplus                                                                      | Learn it |
| Buffer stock: buy $Q_s - Q_d$ at the floor; sell $Q_d - Q_s$ at the ceiling                                                       | Learn it |
| $\% \Delta Q_d = PED \times \% \Delta P$ and $\% \Delta Q_s = PES \times \% \Delta P$                                             | Learn it |
| Consumer surplus (straight-line demand) = $\frac{1}{2} \times \text{quantity} \times (\text{top of demand curve} - \text{price})$ | Learn it |

## How to do it

In the questions we have tagged for this topic (117 questions, 2021–2025), 82 are Paper 1 multiple choice and 35 are Paper 2 data response or essay questions. 14 of the Paper 2 questions have parts of more than one type, so the counts add up to 134.

| Question type                                                       | Questions |
|---------------------------------------------------------------------|-----------|
| Multiple choice: effects of a maximum or minimum price              | 27        |
| Multiple choice: subsidy diagrams, effects and cost                 | 18        |
| Multiple choice: tax diagrams, incidence and revenue                | 17        |
| Assess a maximum or minimum price policy                            | 13        |
| Multiple choice: direct provision, information, or the right policy | 12        |

| Question type                                                                   | Questions |
|---------------------------------------------------------------------------------|-----------|
| Assess a subsidy                                                                | 9         |
| Multiple choice: buffer stock and price-support calculations                    | 8         |
| Assess direct provision or free provision                                       | 7         |
| Explain with a diagram how a tax or subsidy changes a market, and its incidence | 6         |
| Assess a buffer stock scheme                                                    | 5         |
| Assess provision of information, or compare methods for merit and demerit goods | 5         |
| Explain with a diagram the effect of a minimum or maximum price                 | 4         |
| Assess an indirect tax                                                          | 3         |

Paper 2 marking (4- and 6-mark data parts, 8- and 12-mark essay parts) is set out in "How to get the marks".

## 1. Multiple choice: effects of a maximum or minimum price (27 questions)

1. **Check which side of equilibrium the control is on.** A maximum price below equilibrium, or a minimum above, is effective. A maximum above equilibrium, or a minimum below it, has no effect: the market price carries on.
2. **Maximum below:**  $Q_d$  rises,  $Q_s$  falls, shortage, rationing, illegal markets, fewer units traded.
3. **Minimum above:**  $Q_s$  rises,  $Q_d$  falls, surplus, consumer surplus falls.
4. **Why set one?** A minimum price supports producers' incomes or cuts consumption of a demerit good; a maximum price keeps a necessity affordable.

### Variations you will meet:

- **Numbers from elasticities.** Equilibrium 400 units at \$8, PES 1.5, PED  $-0.5$ , minimum price \$10: the price is 25% higher, so  $Q_s$  rises  $1.5 \times 25\% = 37.5\%$  to 550 and  $Q_d$  falls  $0.5 \times 25\% = 12.5\%$  to 350, a surplus of 200.
- **Numbers from equations.** Put the controlled price into both equations, compare  $Q_d$  and  $Q_s$ , and find the equilibrium to see whether the control is above or below it.
- **Which minimum price and PED cut consumer surplus most?** A minimum price below equilibrium does nothing. Above it, consumer surplus falls most when demand is **inelastic**, because consumers keep buying the same amount at the higher price.
- **Which minimum price and PED leave the most unsold?** A different question with the opposite answer: the surplus is largest when demand is **elastic** and the minimum price is **higher**, because more buyers drop out (with a fixed supply, such as stadium tickets,  $\text{unsold} = \text{seats} - Q_d$ ).
- **A fixed supply** (stadium seats, a set amount of electricity): supply is vertical, so a maximum price below equilibrium cuts the price without cutting the quantity supplied, but still leaves a shortage (for electricity, power cuts become more likely).
- **A maximum price and supply rising at the same time:** find the new equilibrium; if it is now below the maximum, the control no longer bites and a normal equilibrium is reached.

- **A maximum price does not raise consumption.** Quantity actually bought is the quantity **supplied**, which falls.
- **Why not buy the surplus of alcohol?** Buying it would be costly, and the aim is to cut consumption.

## 2. Multiple choice: subsidy diagrams, effects and cost (18 questions)

1. A subsidy shifts **supply** to the right (down by the subsidy). Price falls, quantity rises. It is not repaid.
2. **The subsidy per unit** is the **vertical** distance between S1 and S2, not the change in price.
3. **Government spending** is the rectangle: subsidy per unit (height)  $\times$  **new** quantity (width).
4. **Consumers' gain** per unit is the fall in price; **producers' gain** is the rise in the price they receive (market price plus subsidy).

### Variations you will meet:

- **New price and quantity:** read where S2 meets D; a \$2 subsidy on a \$5 fare need not cut the fare to \$3.
- **Changes in spending:** compare consumer spending, price  $\times$  quantity, before and after.
- **When is the cost smallest?** When demand and supply are both **inelastic**, because quantity rises least. When do sales barely rise? When PED **and** PES are low.
- **Perfectly inelastic demand:** the price falls by the whole subsidy and quantity does not change, so consumers get all of it and producers get nothing extra.
- **Raise farm incomes without raising food prices:** a subsidy (a minimum price would raise prices).
- **What is not a producer subsidy?** A payment to households, such as unemployment benefit.
- **Subsidising one input** (such as capital) makes it cheaper relative to a substitute input (labour), so firms use less of the substitute.

## 3. Multiple choice: tax diagrams, incidence and revenue (17 questions)

1. A specific tax shifts supply **up** by the tax, parallel; an ad valorem tax pivots it.
2. **Revenue** is the rectangle: tax per unit  $\times$  **new** quantity. Split it at the old price: above is the consumers' share, below is the producers' share.
3. **Incidence** is the share paid by consumers relative to producers, and it depends on PED and PES (use the table in "Understand it").

### Variations you will meet:

- **"Which situation makes producers bear more?"** Elastic demand, or inelastic supply.
- **PES = 0:** the whole burden falls on producers; the price does not change.
- **Revenue with elasticities.** Supply perfectly elastic, so the price rises by the whole tax. For 500 units at \$4, PED 2 and a 25% tax: the price rises 25% to \$5, quantity falls  $2 \times 25\% = 50\%$  to 250, and revenue is  $\$1 \times 250 = \$250$ .
- **Areas:** consumer surplus lost is the area between the old and new price, left of the demand curve; the firm's revenue after tax is the price it keeps  $\times$  new quantity.

- **Removing a tax** when demand is elastic: the price falls and quantity rises a lot, so producers' revenue rises most.

#### 4. Assess a maximum or minimum price policy (13 questions)

Usually a 6-mark data response ("assess whether a maximum price is the best way to ...") or a 12-mark essay.

1. **Explain how it works**: where the price is set, what happens to  $Q_d$  and  $Q_s$ ; a diagram with the shortage or surplus marked.
2. **For and against** (up to 3 marks each): the effects under "Maximum prices" and "Minimum prices" above, plus: a maximum price stops sellers exploiting a crisis and discourages hoarding; a minimum price may be set at the wrong level.
3. **"Best way"**: analyse at least one alternative (subsidy to producers, buffer stock, transfer payments, lower import taxes, investment in storage and irrigation) with its own strength and weakness.
4. **Evaluate**: how far from equilibrium it is set, PED and PES, enforcement, how long it lasts; then a justified conclusion.

Link every point to the question's aim ("farmers' incomes", "stabilising prices"). A minimum **wage** is not an answer about minimum prices for a product.

#### 5. Multiple choice: direct provision, information, or the right policy (12 questions)

1. **Direct provision** = the government itself supplies it: a mobile government library, a state school, road repairs, a public hospital, taking over a private service. Not: charities, private firms, subsidies, taxes, price controls.
2. **Provision of information shifts demand**. Taxes and subsidies shift supply.
3. **Tax + information on a demerit good**: supply left **and** demand left.
4. **Right policy for the good**: subsidise, provide or inform about a merit good; tax, set a minimum price or inform about a demerit good.

#### Variations you will meet:

- **A statement that is not true of direct provision**: a flood-control dam is a **public** good, not a merit good; providing it still has an opportunity cost and is government allocation of resources.
- **Objections to government provision**: opportunity cost, inefficiency, and crowding out: private-sector investment may fall (not "more consumer sovereignty").
- **Effects on other markets**: more public housing lowers rents in the private sector; removing fees for higher education takes away private providers' income, so the private sector is less likely to provide it.
- **A maximum price plus a subsidy** on a merit good: the subsidy raises supply so the maximum price does not create as big a shortage, and consumption rises.

## 6. Assess a subsidy (9 questions)

1. **Mechanism and diagram:** the chain and diagram under "Subsidies" above; a diagram with the new equilibrium earns 1 mark.
2. **For and against:** use the effects and risks listed there, each linked to the case in the question (a merit good, cheap electricity, farmers' incomes, exporters who may face retaliation abroad).
3. **Evaluate:** it depends on PED, how long the subsidy lasts and whether it is targeted.

"Should the government subsidise a merit good?" or "best way" needs **at least one alternative** (information, direct provision). "How effective is a subsidy?" needs its strengths and weaknesses only; don't spend the answer on other policies.

## 7. Multiple choice: buffer stock and price-support calculations (8 questions)

1. **At the floor:** amount bought =  $Q_s - Q_d$  at the floor price (the horizontal gap on the diagram). Cost = floor price  $\times$  amount bought.
2. **At the ceiling:** amount sold from stock =  $Q_d - Q_s$  at the ceiling.
3. **Inside the band:** do nothing.

### Variations you will meet:

- **Holding the price at a level in two different years:** the extra bought in year 2 is the extra harvest at that price.
- **Raising the price to a target** with a fixed harvest: buy harvest  $- Q_d$  at the target, and pay target price  $\times$  that amount.
- **Income support:** pay each year the gap between the promised income and price  $\times$  quantity from that year's harvest; add up the years.
- **Which good suits a scheme, and when does it last longest?** Cheap to store, not perishable, hard for new farmers to start producing, and rising demand.
- **Who benefits in plentiful harvests?** Growers (the scheme stops the price collapsing).

## 8. Assess direct provision or free provision (7 questions)

Use the for and against lists under "Direct provision" in "Understand it", applied to the case (free childcare, state electricity, public transport), then a judgement. Keep to the group the question names: "advantageous to **consumers**" needs effects on consumers (prices, quality, reliability), not on the budget. In a 4-mark data part: up to 3 for analysis across both sides, 1 for a judgement.

## 9. Explain with a diagram how a tax or subsidy changes a market, and its incidence (6 questions)

Usually an 8-mark essay part (a).

1. **AO1, 3 marks:** define an indirect tax (on spending; specific or ad valorem) and incidence (the share of the burden borne by consumers and producers); an accurate diagram with S1, S2, D, both prices, both quantities.
2. **AO2, 3 marks:** the tax shifts supply up, price rises by less than the tax; analyse incidence when demand is **inelastic** (most passed to consumers) and when it is **elastic** (mostly borne by producers). Explain the diagram in words.
3. **AO3, 2 marks:** how far the incidence can be passed on depends on PED (and PES); reach a justified conclusion.

For a subsidy, use the same plan: supply right, price falls by less than the subsidy, spending rectangle, and how the split and the cost depend on PED.

## 10. Assess a buffer stock scheme (5 questions)

1. **Purpose** (1): to reduce price fluctuations and stabilise farmers' incomes.
2. **Mechanism** (up to 2): buy and store below the floor (cutting supply), release stock above the ceiling (adding supply).
3. **Evaluation** (1, or Table B in an essay): the problems listed under "Buffer stock schemes". In an essay, use the diagram, weigh stable incomes against the costs, and compare an alternative (subsidy, income support).

## 11. Assess provision of information, or compare methods for merit and demerit goods (5 questions)

Explain the demand shift (with the diagram if asked), give the for and against from "Provision of information" above, then **compare** with at least one other method (tax, minimum price, subsidy, direct provision) and judge which works best for **that** good, for example information plus a tax for sugary drinks. Don't offer taxes on demerit goods as a way to raise merit-good consumption.

## 12. Explain with a diagram the effect of a minimum or maximum price (4 questions)

1. **Diagram:** axes Price and Quantity, D and S, equilibrium, the control line on the correct side of equilibrium, both quantities marked and the surplus or shortage labelled.
2. **Explain:** at the higher price supply extends and demand contracts, so there is a surplus (or the reverse for a maximum price).
3. **Consequences:** for consumers (define consumer surplus; it falls because they pay a higher price for fewer units, shown as the area lost on the diagram); for producers (higher price per unit but unsold stock unless the government buys it).
4. **Evaluate:** the size of the fall in consumer surplus depends on PED; reach a justified conclusion.

### 13. Assess an indirect tax (3 questions)

12-mark essays such as "is a higher tax the best way to cut consumption of a demerit good?" or "does the incidence of a tax on a necessity fall mainly on the producer?".

1. **Knowledge and analysis:** the tax diagram and incidence from "Understand it". With **inelastic** demand (necessities, addictive goods) consumption falls little and most of the tax falls on consumers; revenue can fund information or health care; the tax is regressive; very high taxes encourage illegal markets.
2. **Alternatives** for "best way": information or a minimum price, weighed against the tax.
3. **Evaluation:** it depends on PED and PES and the size of the tax. A necessity usually has inelastic demand, so the burden falls mainly on the **consumer**.

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## Worked examples

### Example 1

A market is in equilibrium at a price of \$12 and a quantity of 80 units. The government imposes a specific tax of \$6 per unit, and the new equilibrium is \$16 and 60 units. Which statement is correct?

- **A** Tax revenue is \$480, of which consumers pay \$360.
- **B** Tax revenue is \$360, of which consumers pay \$240.
- **C** Tax revenue is \$360, of which producers pay \$240.
- **D** Tax revenue is \$480, of which producers pay \$120.

[1]

Revenue =  $6 \times 60 = \$360$  (use the **new** quantity, not 80). The price rose by \$4, so consumers bear  $4 \times 60 = \$240$  and producers the other  $2 \times 60 = \$120$ . The answer is **B**. (1)

A and D use the old quantity; C swaps the shares.

### Example 2

Consider whether a buffer stock scheme would reduce fluctuations in the price of rice. [4]

A buffer stock scheme sets a minimum and a maximum price for rice and is designed to keep the price between them. (1)

When a good harvest would push the price below the minimum, the agency buys rice and stores it, which takes supply off the market and holds the price up. (1) When a poor harvest would push the price above the maximum, it sells rice from its store, which adds to supply and holds the price down. (1)

However, it only works while the agency has money and stock: after several good harvests it may be unable to afford to buy and store any more, and after several poor ones its store may be empty, so it reduces fluctuations only if the band is set around the long-run average price. (1, evaluation)

### Example 3

With the help of a diagram, explain the effects of a subsidy given to the producers of a good, and consider whether consumers or producers gain more from the subsidy. [8]

A subsidy is a payment from the government to producers, here a fixed amount for each unit produced; it is not repaid. (AO1, 1) It lowers the cost of supplying each unit, so the supply curve shifts down by the amount of the subsidy, from  $S_1$  to  $S_2$ . (AO1, 1)

*Diagram: axes Price and Quantity;  $D$ ,  $S_1$  and  $S_2$  below  $S_1$  by the subsidy; equilibria at \$12 and 80 units and at \$8 and 100 units; the price producers receive, \$14, marked; the subsidy rectangle split at \$12 into the consumers' and producers' gains.* (AO1, 1)

At the old price there is now excess supply, so the price falls, from \$12 to \$8, and the quantity bought rises from 80 to 100. (AO2, 1) The price falls by less than the \$6 subsidy: consumers gain \$4 a unit through the lower price, and producers gain \$2 a unit because they receive \$8 plus \$6 = \$14 rather than \$12. (AO2, 1) The government pays  $6 \times 100 = \$600$ , of which \$400 goes to consumers and \$200 to producers, and this spending has an opportunity cost. (AO2, 1)

Who gains more depends on elasticity. Here demand is less elastic than supply, so consumers gain more; if demand were elastic and supply inelastic, most of the subsidy would stay with producers as a higher price received. (AO3, 1)

So consumers gain more when demand is price inelastic, which is typical for essentials such as food and electricity; for goods with many substitutes the producers gain more. (AO3, 1, justified conclusion)

**Total:  $3 + 3 + 2 = 8$ .**

### Example 4

Assess whether a maximum price is the best way to make rented housing affordable for households on low incomes. [12]

*Knowledge and analysis (Table A):*

A maximum rent is a legal ceiling set below the equilibrium rent. Tenants who find a flat pay less, and landlords can no longer exploit a housing shortage by raising rents. *Diagram:  $D$  and  $S$  for rented flats, the maximum rent below equilibrium, both quantities marked, the shortage labelled.*

But at the lower rent quantity demanded extends while quantity supplied contracts, as some landlords sell or stop letting. Fewer flats are rented than before, so some low-income households cannot find one at all; flats are rationed by waiting lists, illegal side payments appear, and landlords spend less on repairs.

An alternative is direct provision: the government builds flats and lets them below market rents. This adds to supply, so there is no shortage, but it is expensive, with a large opportunity cost, and state housing can be badly managed. A subsidy to builders of low-cost housing also shifts supply right and lowers rents, but costs the government money and may be kept as profit.

(Balanced analysis of the maximum price and two alternatives, with the diagram explained: Level 3, 8 marks.)

*Evaluation (Table B):*

A maximum rent works quickly and costs the government almost nothing, but it helps only tenants who already have a flat, and the shortage grows over time because supply is more elastic in the long run. Building or subsidising housing is slower and costs tax money, but it tackles the real problem, too few affordable flats. So a maximum rent is not the best way on its own: it can help in an emergency, but in the long run adding supply is better, if the government can afford it.

(A judgement that answers "best way", says what it depends on and reaches a justified conclusion: Level 2, 4 marks.)

**Total:  $8 + 4 = 12$ .**

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## Common mistakes

- **Drawing the control on the wrong side of equilibrium.** Examiners report candidates who draw a minimum price below equilibrium or a maximum price above it. A minimum price goes above, a maximum price below; otherwise it has no effect.
- **Writing about the wrong control.** In several series candidates wrote about a maximum price when asked about a minimum price, or the reverse. Underline which one the question names.
- **Stating a surplus or shortage without saying why.** Say that at the higher price supply extends and demand contracts, then explain the **problem** it causes (who buys the surplus, what it costs).
- **Diagrams without the key labels.** Label the axes (Price, Quantity, not "price level" and "real output"), S, D, the control price, both quantities and the gap, and explain the diagram in words.
- **Taking the change in price as the subsidy.** The subsidy per unit is the **vertical** gap between S1 and S2. In one March paper about half the candidates chose the change in price instead.
- **Forgetting PES.** Incidence and a subsidy's effect on sales depend on supply elasticity too: with  $PES = 0$  a tax falls entirely on producers.
- **Using the old quantity for revenue or spending.** Tax revenue and subsidy spending use the quantity **after** the change.
- **Answering "best way" without an alternative,** or answering "how effective is a subsidy?" by writing only about other policies. Read which one the question wants.
- **Not knowing what a buffer stock is.** Examiners report answers that could not explain the mechanism, so they could not reach Level 3. Learn: floor, ceiling, buy and store, release.
- **Little or no evaluation.** It is 4 of 12 marks in essays and 2 of 6 in data response.

## How to get the marks

- **Command words.** *Explain*: how and why, linked with "so" and "because". *Consider*: explain, then a short judgement. *Assess / discuss*: both sides, then a judgement that answers the exact words ("best way", "outweigh", "always").
- **Data response 4 marks**: three developed points of analysis plus one evaluative sentence. **6 marks**: up to 3 for each side (4 in all), then "It depends on ..." (1) and a conclusion that answers the question (1). One-sided answers lose both evaluation marks.
- **Essay (a), 8 marks: 3 + 3 + 2.** AO1: definitions and an accurate diagram. AO2: the chain of effects (supply shift → price → quantity → who bears or gains), with the diagram explained in words. AO3: what it depends on (usually PED or PES), then a justified conclusion.
- **Essay (b), 12 marks: 8 + 4.** Level 3 needs developed analysis of both sides and, for "best way" questions, at least one alternative analysed with its strengths and weaknesses. A required diagram that is missing keeps you out of Level 3.
- **Use the data.** In data response, quote the extract (the country, the product, the policy it describes) in your points; generic answers lose marks.
- **Link to the named aim and group.** "Farmers' incomes", "consumers", "stabilising prices": every point should end with its effect on that aim or group.
- **Multiple choice:** sketch the diagram in the margin; use new quantities for rectangles; check whether a control is effective before choosing an effect.

## Quick check

1. Which is an example of direct provision by a government?
  - **A** A payment of \$1 per passenger to private bus companies.
  - **B** A state-run hospital that treats patients free of charge.
  - **C** A food bank run by a charity.
  - **D** A legal limit on the rent landlords may charge.
2. A market is in equilibrium at \$20 and 200 units. PES is 1.5 and PED is  $-0.5$ . The government sets a minimum price of \$22. Find the surplus, and what it would cost the government to buy it.
3. Supply of a good is perfectly elastic at \$5, and 2000 units a week are sold. PED is  $-0.8$ . The government imposes a 20% ad valorem tax. Find the weekly tax revenue.
4. In a market for maize, quantity demanded is  $Q_d = 500 - 20P$  (thousand tonnes,  $P$  in \$). A buffer stock scheme has a floor of \$15 and a ceiling of \$20. In year 1 the harvest is 260 thousand tonnes; in year 2 it is 80 thousand tonnes. What does the agency do each year, and what stock does it have left after year 2?
5. A subsidy is given to producers of a good with perfectly inelastic demand. Explain why consumption does not rise and who gains from the subsidy. **[4]**

## Answers

1. **B.** The government itself supplies the service. A is a subsidy, C is a charity, D is a maximum price. (1)
2. The price is  $\frac{22-20}{20} \times 100 = 10\%$  higher.  $Q_s$  rises  $1.5 \times 10\% = 15\%$  to 230;  $Q_d$  falls  $0.5 \times 10\% = 5\%$  to 190. Surplus =  $230 - 190 = 40$  units. Buying it costs  $22 \times 40 = \$880$ .
3. With perfectly elastic supply the price rises by the whole tax: 20% of \$5 is \$1, so the price becomes \$6. Quantity falls  $0.8 \times 20\% = 16\%$ , to  $2000 \times 0.84 = 1680$ . Revenue =  $\$1 \times 1680 = \$1680$  a week.
4. Year 1: the free price would be  $500 - 20P = 260$ ,  $P = 12$ , below the floor. At \$15,  $Q_d = 500 - 300 = 200$ , so the agency buys  $260 - 200 = 60$  thousand tonnes, costing  $60 \times 15 = \$900$  thousand. Year 2: the free price would be  $500 - 20P = 80$ ,  $P = 21$ , above the ceiling. At \$20,  $Q_d = 100$ , so it sells  $100 - 80 = 20$  thousand tonnes. Stock left:  $60 - 20 = 40$  thousand tonnes.
5. The subsidy lowers producers' costs, so supply shifts down by the subsidy (1). With perfectly inelastic demand, consumers buy the same quantity whatever the price, so the demand curve is vertical and the quantity cannot rise (1). The price falls by the whole subsidy, so consumers get all of the benefit (1), producers receive the same per unit as before, and the government's spending does not raise consumption at all (1).

## Past questions to try

- **9708/12/O/N/24 Q14:** tax revenue when supply is perfectly elastic and PED is known.
- **9708/12/M/J/24 Q14:** what it costs to raise the price of a fixed harvest by buying the surplus.
- **9708/12/M/J/21 Q8:** surplus at a minimum price from PED and PES.
- **9708/21/M/J/23 Q3:** part (b), whether a buffer stock scheme's benefits always outweigh its disadvantages.