1.4.1 Government intervention part 1 (taxes, subsidies, minimum and maximum prices)

Notes for Edexcel Economics A, unit 1.4.1 government intervention, part 1.

Written by Tom Furber, tfurber.com/edexcel-economics

Contents

Indirect taxes

An indirect tax is a charge put in place by the government on the production or consumption of a good or service.

There are two types of tax:

- Specific tax – the tax is a fixed amount. For example, the firm has to pay a tax of £3 per unit sold.
    - This increases costs for a firm by the same amount per unit sold.
    - Therefore, a specific tax shifts the supply curve left, parallel to the original supply curve.
- *Ad valorem* (according to value) tax – this tax is a percentage of the value of the item, e.g. 10%.
    - This increases the costs for a firm by a greater amount, as the price increases.
    - Therefore, an *ad valorem* tax rotates the supply curve so that it becomes steeper.

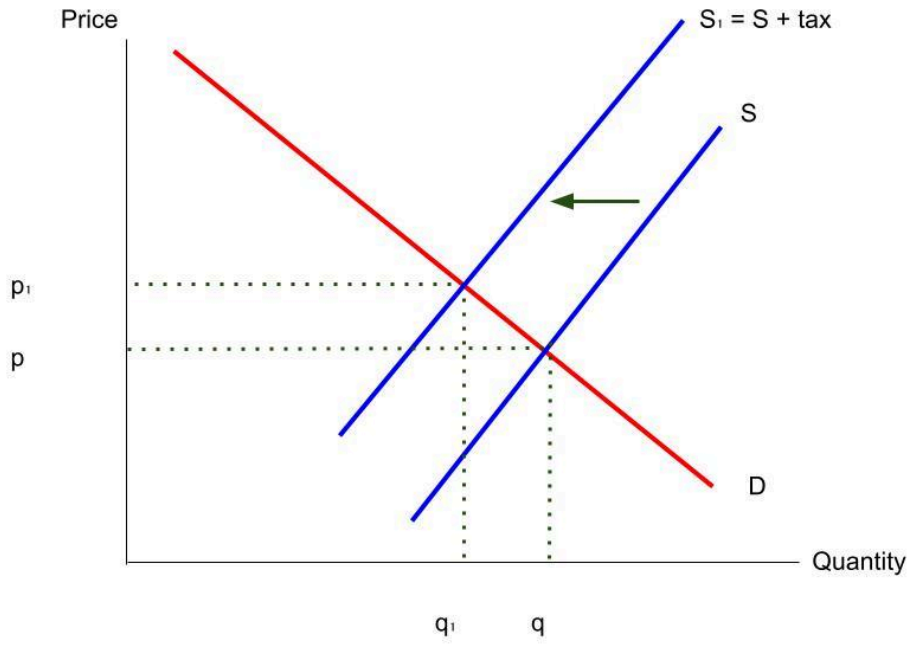
Examples of taxes include:

- The soft drinks industry levy (SDIL), a tax on drinks with high concentration of sugar.
- Alcohol duty.
- Fuel duty.

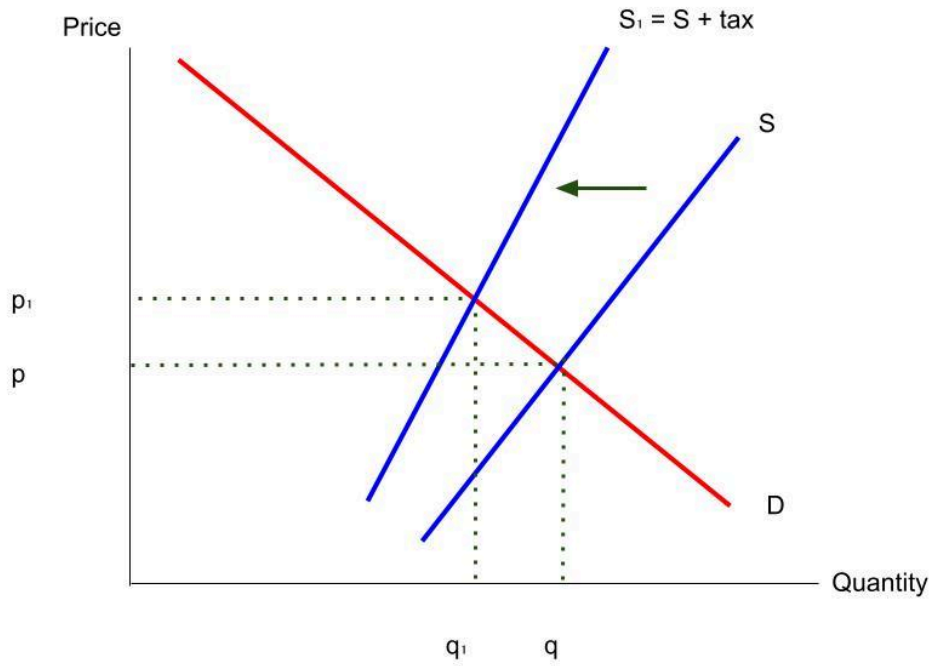
Diagrams for taxes

1) Simple tax diagrams - specific versus ad valorem

A specific tax shifts supply left from S to S1, where the new supply curve is parallel to the original supply curve. See the diagram below. As a result, the price increases from p to p1 and the quantity falls from q to q1.



An ad valorem tax shifts the supply curve from S to S1 with a rotation, such that the supply curve becomes steeper. Otherwise, the tax has similar consequences, namely a rise in price and a fall in quantity. See the diagram below.



2) Incidence, consumer and producer surplus diagrams

The diagrams for tax incidence and change in consumer and producer surplus are covered separately in topic 1.2.9: Indirect taxes and subsidies. See this page for a link to those diagrams.

In short, when there is no market failure present, taxes can create a welfare loss.

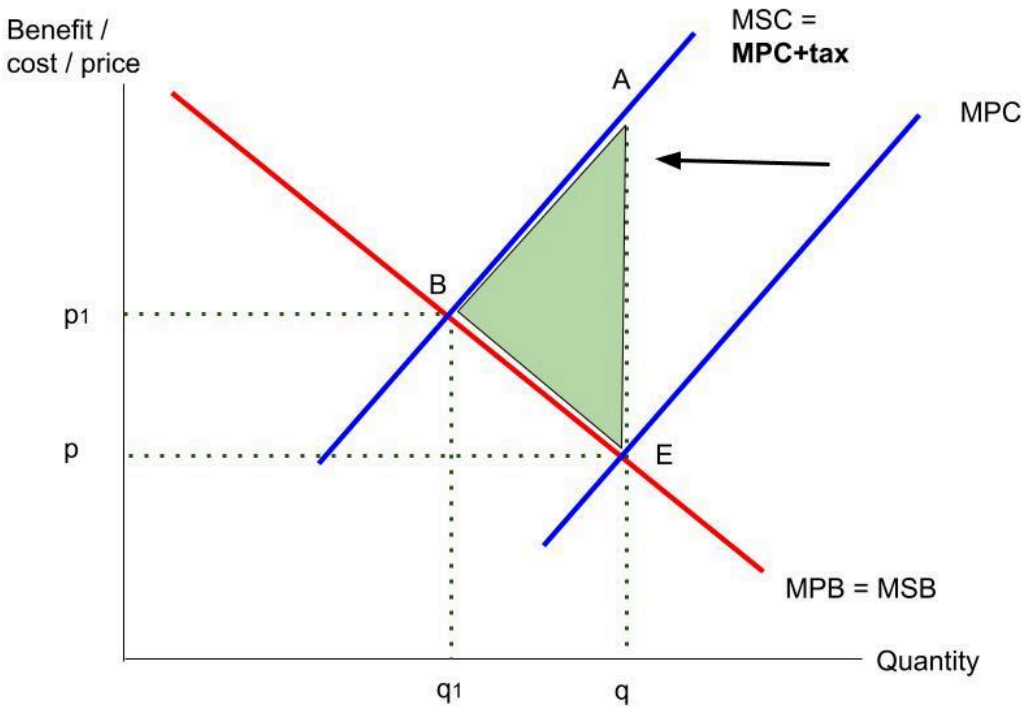
3) Taxes to correct a market failure.

However, where a tax reduces the extent of market failure, the tax can cause a welfare gain. Suppose there is a negative externality of production. The marginal social cost (MSC) exceeds the marginal private cost (MPC).

- An example could be the pollution from the production of steel.
- The free market outcome is where MPB = MPC at (q,p), which assumes firms and consumers only take into account private costs and benefits.
- The socially optimal outcome is where MSC = MSB, at (q1,p1).
- Thus, in the free market without government intervention, there is overproduction of q-q1.

How does the tax help?

- The tax shifts the MPC (which is effectively the firm's supply curve) to the left from MPC to MPC + tax.
- If the tax is set at the right level, this helps to align MPC + tax with MSC. In other words, firms "internalise" the external costs of their decisions.
- This reduces the free market quantity from q to q1. This eliminates overproduction, increasing social welfare.



What are the advantages and disadvantages of a tax?

Effects of a tax

Advantages	**Disadvantages**
Reduces extent of overconsumption or overproduction (when there is market failure).	Lower consumer surplus and can increase inequality. These taxes can be regressive.
Raises tax revenue	Lower producer surplus. This can reduce profits, investment and employment.
Encourages producers and consumers to switch to welfare-improving substitutes.	Consumers could switch to unhealthy substitutes.
The effects of a tax depend on	
Price elasticity of demand	
Cross elasticity of demand	
Extent of government failure.	

The advantages of a tax are:

- **Reduces extent of overconsumption or overproduction** (when there is market failure).
    - For instance, where a good exhibits negative externalities, a tax may reduce the free market quantity, moving it closer to the socially optimal quantity. This could increase social welfare.
    - Examples could include alcohol, cigarettes, or the release of pollution from driving or manufacturing.
- **Raises tax revenue**
    - Tax revenue could go towards further schemes to tackle market failure for demerit goods, such as information campaigns or subsidies for substitutes.
- **Encourages producers and consumers to switch to welfare-improving substitutes**.
    - As the taxed, unhealthy good becomes more expensive, consumers may switch to consuming healthier substitutes to the goods being taxed. For example, if sugary drinks are taxed, consumers may switch to sugar free alternatives or fruit smoothies.
    - As firms make less profit from producing the taxed good, firms may switch production to untaxed alternatives too.

The disadvantages of a tax are:

- **Lower consumer surplus**
    - The higher price and reduced equilibrium quantity lead to reduced consumer surplus.
    - An indirect tax is regressive. The tax payment takes up a larger proportion of income for those on low income. Hence the tax could increase inequality.
- **Lower producer surplus**
    - Firms may only be able to pass on some of the tax burden to consumers by raising prices. So firms may bear some of the tax burden.
    - This reduces firm profits. Firms could be more likely to shut down as a result.
    - As a result, firms may have less funds to invest, reducing investment in product quality.
    - The decrease in firm output could reduce demand for labour (demand for labour is derived from the demand for goods and services). This could increase unemployment rates.
- **Consumers could switch to harmful substitutes**.
    - A tax on sugary drinks could lead consumers to switch to other unhealthy drinks to avoid paying the tax. These alternative drinks could also be unhealthy or even less healthy than the sugary drinks being taxed.
    - Examples could include sweetened drinks, energy drinks or more sugary foods if these are not part of the sugar tax.

The effect of the tax depends on:

- The **price elasticity of demand** (PED) for the good being taxed.
    - If the demand is price-inelastic, then the tax will lead only to a small fall in quantity and a larger rise in price.
    - This would mean little effect on consumers' health. Sugar can be addictive and so is likely to have an inelastic PED, meaning the tax on its own may have less direct benefits for consumer health.
    - The PED could however change over time, as more substitutes may enter the market. So the PED would become more elastic. Hence the quantity fall, as a result of the tax, would be greater for sugary drinks, improving the effect on consumers' health and reducing external harm.
- The **cross elasticity of demand** (the extent to which a price change in the good being taxed affects demand for other goods).
    - Some goods may prove distant substitutes.

    - For example, a tax on petrol cars may not persuade some consumers to switch to electric vehicles.
    - For some consumers, there may be a lack of EV charging infrastructure in rural areas or they may like the sound that petrol cars make.
    - This would make consumers less likely to see the two car types as substitutes.
    - This could give the goods a positive XED value close to zero.
- The extent of **government failure**
    - The government could **lack information** about the extent of the market failure. Therefore, the government may set the tax rate too high, resulting in an overcorrection of the market failure. This could lead to a welfare loss from too little being produced.
    - There could also be **unintended consequences** of the tax, such as encouraging consumers to switch to unhealthy substitutes or encouraging smuggling of goods into the country to avoid the tax.

Subsidies

A subsidy is a government payment to a firm to encourage production of a particular good.

For example the UK Government is subsidising charging port infrastructure for electric vehicles with a cost of £140 million.

Another example is the UK Government subsidises solar panels. Homeowners can receive grants of up to £14,000 for home improvements, including solar panels, under the ECO4 scheme.

What are the advantages and disadvantages of a subsidy?

Effects of a subsidy

Advantages	**Disadvantages**
Increase in quantity can resolve market failure for merit goods	Cost of subsidy to the government
Increase in consumer surplus	Firms may become dependent on the subsidy
Increase in producer surplus	The subsidy may distort competition
The effects of subsidies depend on	
Elasticities - PED, PES	
The design of the subsidy	
Government failure	

The advantages of a subsidy include:

- **Increase in quantity can resolve market failure for merit goods**
    - Merit goods are goods that are underconsumed in the free market. This could be because of positive externalities or because of an information failure leading to underconsumption. Examples of merit goods include education or healthcare.
    - The subsidy, by shifting the supply curve right, increases the equilibrium quantity of the merit good. This could increase social welfare, by reducing the extent to which the merit good is underconsumed.
- **Increase in consumer surplus**
    - Lower prices and a higher quantity together make consumers better off.
    - This could increase access to the good for those on lower incomes, making the good more affordable.
- **Increase in producer surplus**
    - The subsidy money helps to reduce costs for businesses, increasing profits.
    - Subsidies could be reinvested by the firm. For example into improving product quality or reducing future costs of production. This increases future demand from consumers for the solar panels and hence over time profit also increases. If the firm passes on cost reductions to consumers by lowering prices, then consumers experience higher consumer surplus.
- **Encourages consumers to switch away from demerit goods**
    - Demerit goods are goods that are overconsumed in the free market.
    - For example driving a car may cause pollution and traffic, exhibiting negative externalities.

    - By subsidising public transport, consumers may be encouraged to switch away from driving cars.
    - This could increase social welfare, by reducing pollution and traffic.

The disadvantages of a subsidy include:

- **The cost of the subsidy to the government.**
    - Subsidies impact the government budget.
    - Subsidies have an opportunity cost. Spending on a subsidy may mean forgoing spending on healthcare or raising taxes. Particularly with a high budget deficit of 5.4% of GDP for the UK Government for 2021/22.
    - Some subsidies can be large, for example the £600 million pledged to steel companies in addition to current government support in exchange for decarbonisation efforts by the firms.
- **Firms may become dependent on the subsidy.**
    - Subsidies may encourage firms to become dependent on the subsidy money to make a profit.
    - This could reduce investment and innovation at the firm, reducing productivity growth.
    - If the subsidy were removed in the future, the firm may end up being less productive and may be more likely to fail.
- **The subsidy may distort competition**.
    - Subsidies may be given to particular firms rather than all firms in the industry.
    - This could give some firms an unfair advantage in the market.
    - Particularly if less productive firms are awarded subsidies, for instance due to corruption, this could slow productivity growth in the industry as a whole. Less productive firms could be less likely to fail with a subsidy, and more productive firms would find it harder to compete with a subsidy.

The success of a subsidy depends on:

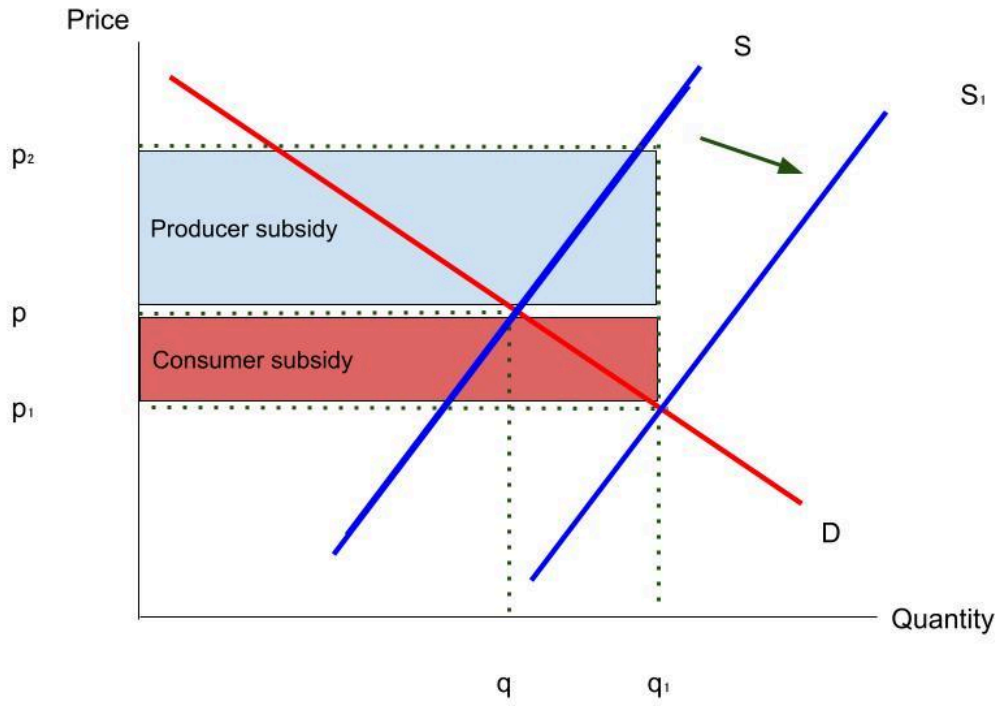
- **The price elasticity of demand (and price elasticity of supply)**:
    - If the PED is elastic, the firm is likely to receive the greater incidence from the subsidy compared to the consumer. In other words, the “consumer subsidy” is smaller than the “producer subsidy”.
    - However if the PED is inelastic, this could mean the subsidy does not increase the equilibrium quantity by much.
    - [Note the price elasticity of supply also matters for the incidence of a subsidy].
- **Government failure:**
    - Whether the Government can estimate correctly the size of the externality / market failure.
    - In practice, estimating the size of the externality may be difficult.
    - This could lead to subsidies being too large.
- **The design of the subsidy**.
    - Does the subsidy target particular firms? In this case, it may cause unfair

advantages / an uneven playing field in the market, distorting competition.
- Alternatively, does the subsidy come with conditions about how to use the subsidy? Conditions may encourage firms to allocate subsidies towards productive uses (investment) rather than going to shareholders.

Diagrams for the subsidy

1) Supply shift right with consumer and producer subsidy.

A subsidy shifts the supply curve to the right from S to S1. This increases the quantity from q to q1 and reduces the price from p to p1. The cost of the subsidy to the government can be split into the producer subsidy and the consumer subsidy. For more on this graph, see this link.



2) Subsidy on top of an externality diagram.

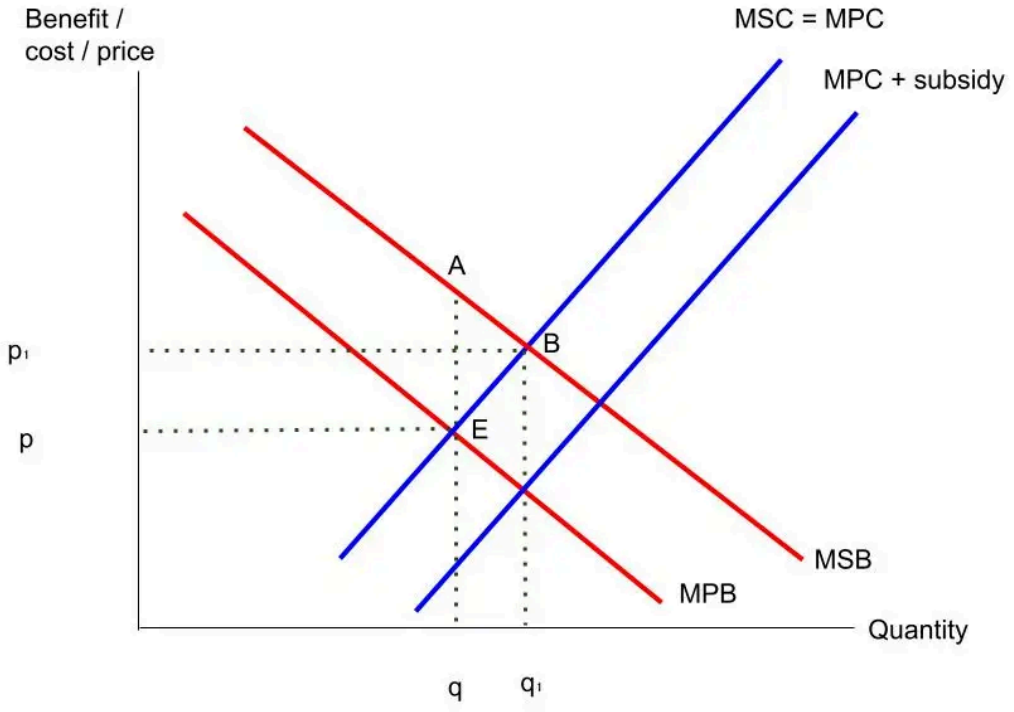
Subsidies can target goods with positive externalities of consumption, such as education or healthcare. In the diagram below, there is a positive externality of consumption, as MSB exceeds MPB.

Without the subsidy:

- The free market outcome occurs where MPB = MPC at (q,p), assuming firms and consumers only consider private costs and benefits.
- The socially optimal outcome occurs where MSB = MSC at (q1,p1).
- As a result, in the free market there is underconsumption of q1-q and a welfare loss of area ABE.

With the subsidy:

- The subsidy shifts the MPC curve to the right from MPC (=MSC) to MPC + subsidy. Note the MPC functions like a supply curve.
- Now, the market outcome with the subsidy occurs where MPC + subsidy meets MPB, which occurs at quantity q1.
- Therefore the underconsumption has been eliminated. This leads to a social welfare gain of area ABE, in other words reversing the welfare loss from underconsumption.



Minimum price

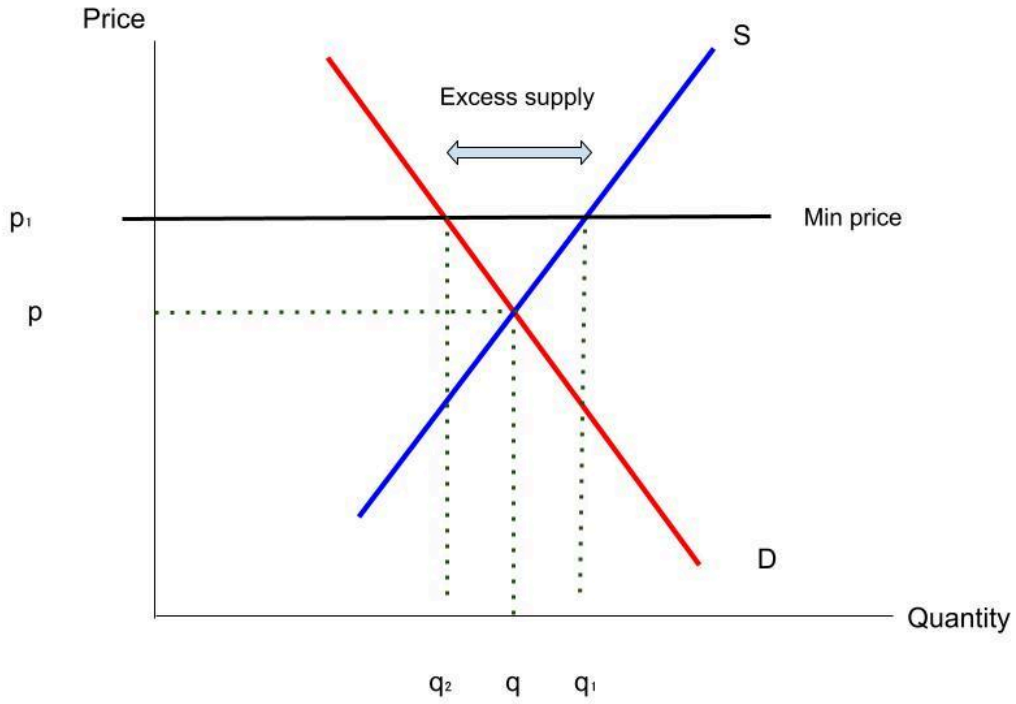
A minimum price is a legal floor below which the price cannot fall.

Examples of minimum prices include:

- Minimum unit pricing for alcohol in Scotland.
- Minimum wages.

Minimum price diagram

- For the minimum price to have an effect, it is placed above the free market equilibrium price p.
- The minimum price is shown as a horizontal line at the minimum price, which increases the price to p1.
- This results in an extension in supply from q to q1.
- There is also a contraction in demand from q to q2.
- Altogether this creates excess supply of (q1-q2).



What are the advantages and disadvantages of a minimum price?

The advantages of a minimum price are:

- **Reduction in demand for demerit goods**
    - There could be a fall in demand for goods such as alcohol.
    - Alcohol could be viewed as a demerit good, overconsumed in the free market. This could be because of negative externalities such as crime and increased healthcare costs for taxpayers, as well as consumers underestimating the health risks from consuming alcohol.
    - Hence, reducing the amount of alcohol consumed could move the market closer to the socially optimal outcome, increasing social welfare.
- **May encourage consumers to switch to consuming goods that are less harmful**.
    - As a result of a minimum price on alcohol, consumers may switch to consuming zero-alcohol drinks.
- **Other benefits of a minimum price**
    - Certainty of income for producers in the face of fluctuating global prices, such as for farmers. This occurs particularly when the minimum price is paired with government purchases of the excess supply. This could increase supply of essentials such as some agricultural goods, increasing food security.
    - Certainty and higher revenues for suppliers in the face of monopsony power (Theme 3). In other words, where a firm is a dominant buyer of a good, a minimum price prevents the buyer from negotiating down the price, increasing supplier revenues.

The disadvantages of a minimum price are:

- **Reduced consumer surplus**
    - The higher price and reduced quantity makes consumers worse off, provided consumers are fully aware of the health risks when consuming.
    - This could punish those who are addicted to alcohol for example, resulting in higher poverty rates among this group.
- **Government failure**
    - As supply exceeds demand at the minimum price, there could be excess supply of the good.
    - This could lead to the formation of illegal markets to sell the good at a price below the minimum price.

    - Where the minimum price is “supported” by government purchases of the excess supply, this increases the cost for the government. Such spending has an opportunity cost; the government could spend this money elsewhere.
- **Producers may become dependent.**
    - If the government guarantees a minimum price, it could reduce the incentive for producers to innovate to cut costs, due to larger profit margins.
    - In other words, producers may become dependent on the government support that accompanies a minimum price. This could reduce investment.

The success of a minimum price depends on:

- **The price elasticity of demand**
    - The PED may be inelastic for some goods facing minimum prices. Alcohol can be addictive and hence its PED may be inelastic.
    - If the PED is inelastic, the excess supply is smaller.
    - Similarly if the PES is inelastic, the excess supply is smaller.
- Whether the minimum price is **accompanied by other policies** to eliminate excess supply.
    - This could be a government policy of purchasing the excess supply.
    - This could shift the demand curve to the right, reducing the extent of the excess supply, albeit at large cost to the government.

Maximum price

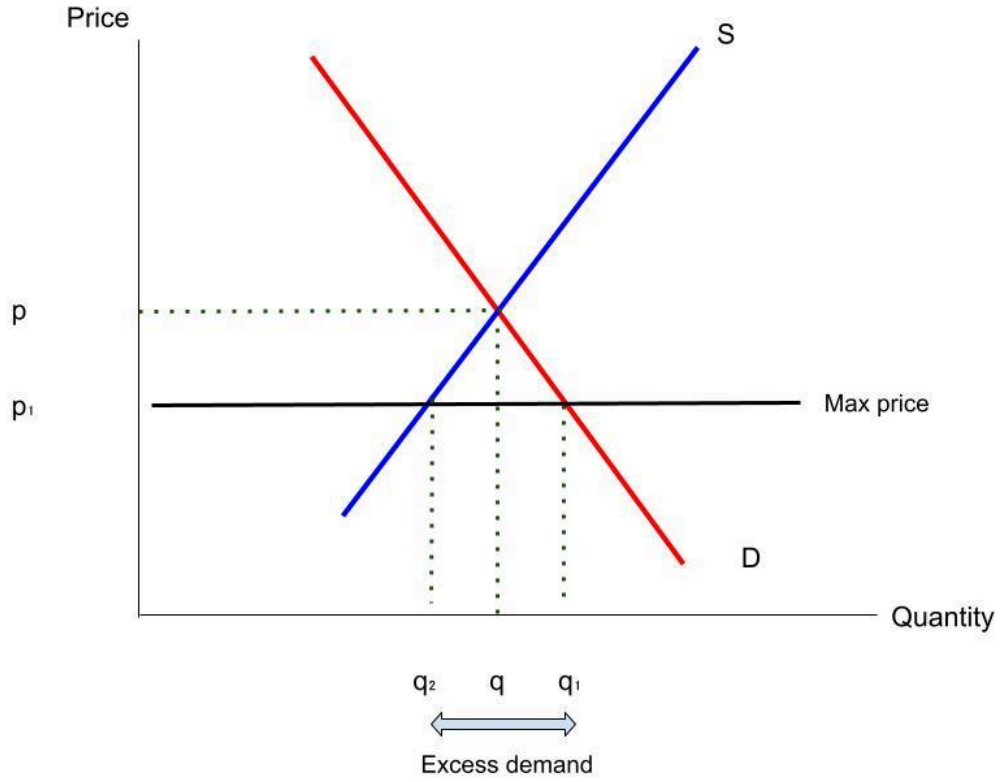
A maximum price is a legal limit that the price cannot exceed.

Examples of maximum prices include:

- Rent controls in Stockholm, Sweden. This is a maximum rent for housing.
- Maximum prices for water in the UK.
- University tuition fees in the UK for home students.

Diagram for maximum price

- The maximum price must be set below the free market equilibrium price to have an effect.
- The horizontal line below shows the maximum price, which lowers the price from p to p1.
- As a result, there is an extension along the demand curve from q to q1.
- There is a contraction in supply from q to q2.
- Altogether this leads to excess demand of (q1-q2).



What are the advantages and disadvantages of a maximum price?

The advantages are:

- **Lower prices for consumers for merit goods**
    - This could make goods more affordable for those on low incomes.
    - Reduce poverty and inequality in access to merit goods such as housing or education.
- **Preventing the abuse of market power**
    - A firm with market power may choose to raise prices to increase its profits. The maximum price could prevent such firms from raising prices, keeping goods affordable for consumers.
- **Other benefits**
    - Those who have lived in the community for a long time are not forced to leave their communities due to a significant rise in rents. This could be economically important if people have jobs, networks or knowledge specific to their community.
    - Certainty for renters, being less worried about a sudden, large rise in their rents.

The disadvantages are:

- **Excess demand**
    - Demand exceeds supply at the maximum price.
    - This could lead to queues or waiting lists for access to services.
    - Some consumers are worse off as they could previously buy the good but cannot any more.
- **Government failure**
    - There may be unintended consequences from a maximum price.
    - For instance, landlords may find ways to circumvent a maximum housing rent, such as adding extra fees for the handover of keys or illegally charging higher rates.
    - A rent control could also lead to greater geographical immobility of labour. Companies in Stockholm, Sweden report finding it more difficult to hire workers as workers may struggle to find accommodation in Stockholm.
- **Reduced producer surplus**
    - The lower price may lead to less incentive to produce the good, as the producer cannot make as much profit.
    - Reduced profits may lead to lower investment, lower employment and make the firm more likely to shut down.

The success of a maximum price depends on:

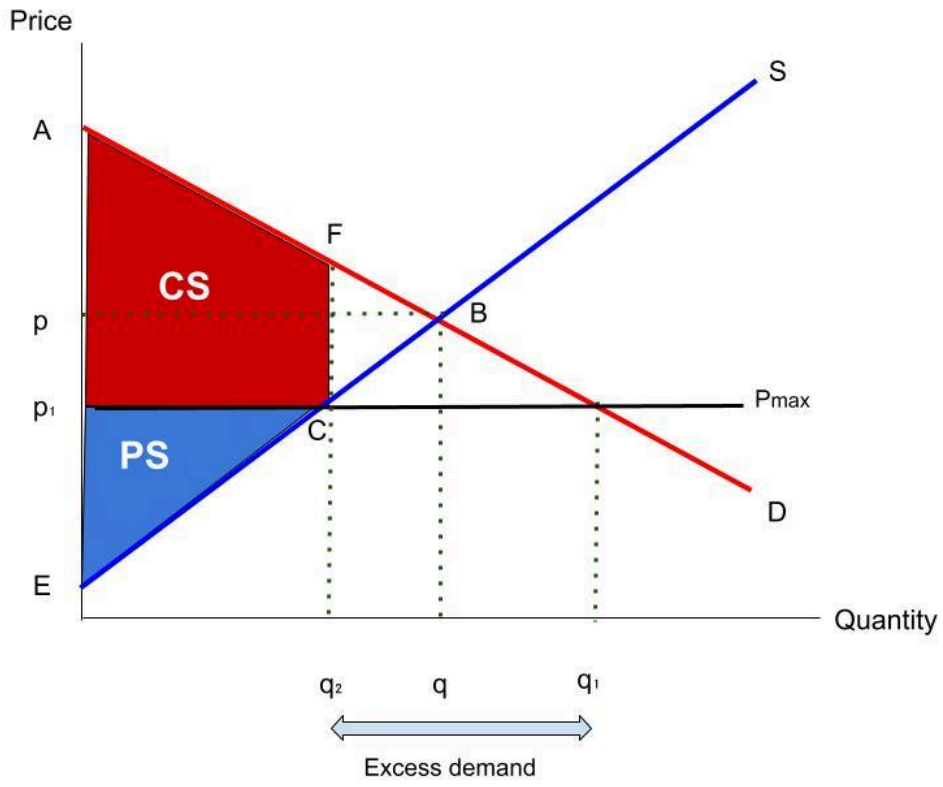
- **The price elasticity of demand** (and the price elasticity of supply)
    - The excess demand will be smaller if the PED is inelastic (and if the PES is inelastic)
- Whether the maximum price is **accompanied by other policies** to correct excess demand:
    - If the maximum price is accompanied by a subsidy, the subsidy would shift supply to the right. This could reduce the extent of any excess demand.

Welfare analysis for maximum prices

The welfare analysis for price controls depends on whether the government “guarantees” the price. For a maximum price, this would mean the government ensures consumers can buy the good at the minimum price without queuing, for instance through subsidies to producers.

Consider the unsupported maximum price below:

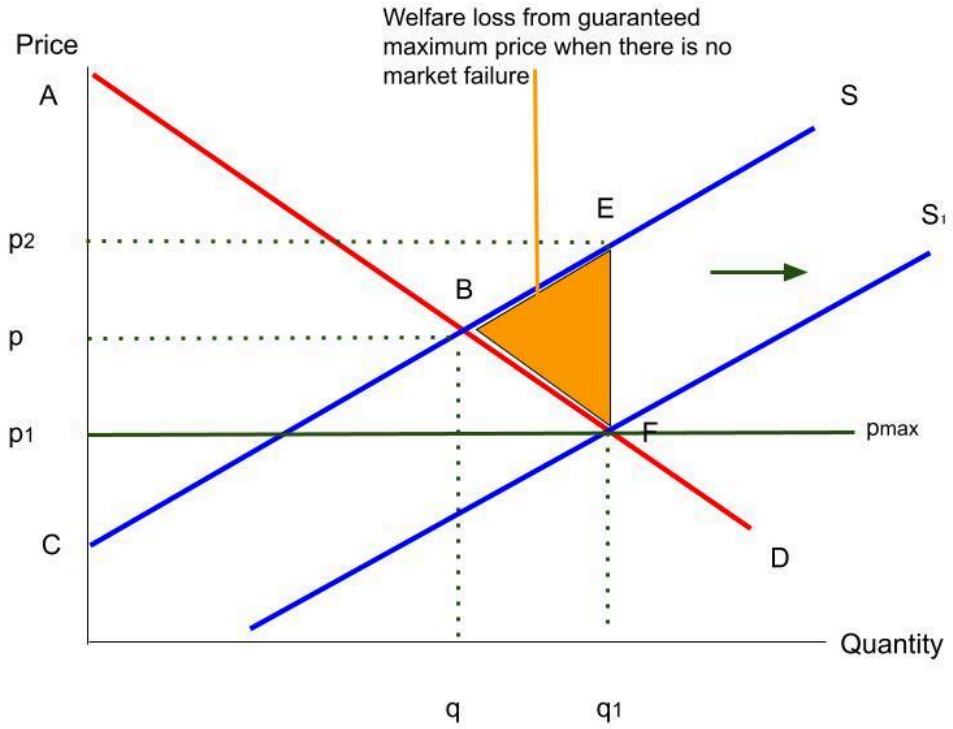
- Without the maximum price, consumer surplus is area ABp and producer surplus is pBE.
- With the maximum price:
    - Consumer surplus is area AFCp1 (shaded red in the diagram below).
    - Producer surplus is area p1CE (shaded blue in the area below).
- In other words, producer surplus falls, while the effect on consumer surplus is unclear.
- Overall there is a welfare loss of area FBC due to the maximum price.



However this changes if the maximum price is supported. For instance with the government subsidising firms to produce more to satisfy the excess demand.

In this case, the welfare analysis becomes equivalent to the subsidy diagram.

- Consumer surplus increases from ABp to AFp1 in the diagram below.
- Producer surplus increases from pBC to ECp2. When there is a subsidy (as with a tax), the original supply curve is used to show the change in producer surplus.
- There is a government cost of guaranteeing the maximum price with the subsidy of p2EFp1.
- This results in a welfare loss of area BEF.
- Subsidy welfare analysis.



For minimum prices, the welfare analysis again depends on whether the minimum price is guaranteed by the government. The government could guarantee that producers receive the minimum price by buying up the excess supply.

Practice question on government intervention

Many universities in the UK are facing funding challenges. Currently, UK universities are funded through tuition fees and government subsidies. Tuition fees are capped for "home" students, with the fee cap rising to £9,535 a year for 2025-26. On average, universities receive £1,150 for each student per year in direct government grants. The government also indirectly subsidises universities by providing tuition loans, where unpaid amounts are written off at the end of the payment period.

Source: IFS (external link)

Evaluate the effectiveness of subsidies and maximum prices in education. (25 marks)

Related resources for Edexcel Economics A

Indirect taxes and subsidies, including welfare analysis and incidence
https://tfurber.com/edexcel-indirect-taxes-and-subsidies/

Theme 1 notes and resources
https://tfurber.com/theme-1-edexcel-economics/

Model answers to practice questions and past papers
https://tfurber.com/edexcel-economics-model-answers/

A separate page will follow on other methods of government intervention, including tradable pollution permits, state provision of public goods, information provision and regulations.