DP IB Economics: SL

Your notes

2.7 Role of Government In Microeconomics

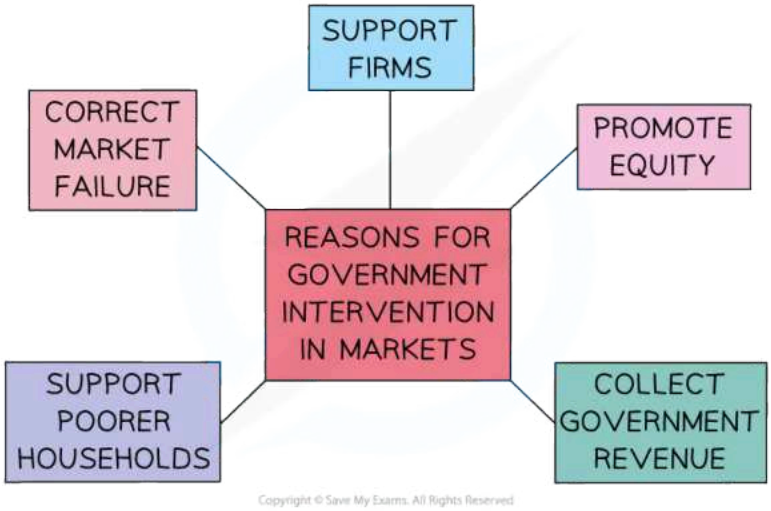
Contents

2.7.1 Reasons For Government Intervention In Markets

Your notes

Reasons why Governments Intervene

- Nearly every economy in the world is a **mixed economy** & has varying degrees of **government intervention**
- Governments intervention is necessary for several reasons



A diagram showing several reasons for government intervention in mixed economic systems

1. **Correct market failure**
   in many markets, there is a **less-than-optimal allocation** of resources from society's point of view so governments intervene to **influence the level of production or consumption**
   - In maximising their self-interest, firms & consumers **will not self-correct** this misallocation of resources & there is a role for the government
   - E.g. Tobacco consumption is an example of market failure that the government has attempted to address by using indirect taxes to reduce consumption

2. **Earn government revenue**
   Governments need money to provide **essential services, public &** merit goods

- Revenue is raised through **intervention** such as taxation, **privatisation**, sale of licenses (e.g. 5G licenses), & the sale of goods/services


Your notes

3. **Promote equity**
   Equity is a normative concept. Governments aim to reduce the **opportunity gap** between the rich & poor but the extent to which it occurs depends on what the society & government believe to be fair. Ways in which equity is promoted include:
   - Laws to protect workers e.g. minimum wage laws, health & safety laws
   - Laws to prevent monopolies from forming as they result in higher prices
   - Laws to prevent environmental damage

4. **Support firms**
   In a global economy, governments choose to **support key industries** so as to help them remain competitive. Ways in which they do this include:
   - Providing subsidies or tax breaks
   - Limiting foreign competition until new firms are well established & are able to compete internationally

5. **Support poorer households**
   Poverty has multiple impacts on both the individual & the economy
   - Intervention through a range **redistribution** policies such as **progressive tax** structures & **welfare payments** helps to reduce poverty

- Four of the most common methods used to intervene in markets are **indirect taxation, subsidies, maximum prices, & minimum prices**

2.7.2 Government Intervention: Indirect Taxes & Subsidies

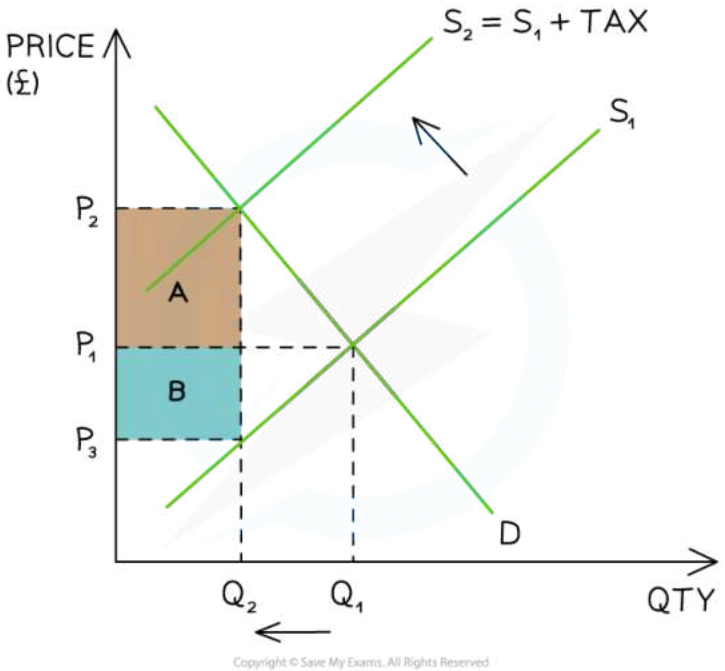
Your notes

Indirect Taxes

- An **indirect tax** is paid on the consumption of goods/services
  - It is only paid if consumers make a **purchase**
  - It is usually levied by the government on **demerit goods** to reduce the quantity demanded (QD) and/or to raise **government revenue**
  - **Government revenue** is used to fund **government provision of goods/services** e.g education
- Indirect taxes are levied by the government on **producers.** This is why the supply curve shifts
- An **indirect tax** can be either **ad valorem** or **specific**

1. A Specific Tax

- A specific tax is a fixed tax per unit of output (specific amount) e.g. $3.25/packet of cigarettes



The impact of an indirect tax is split between the consumer (A) and the producer (B)

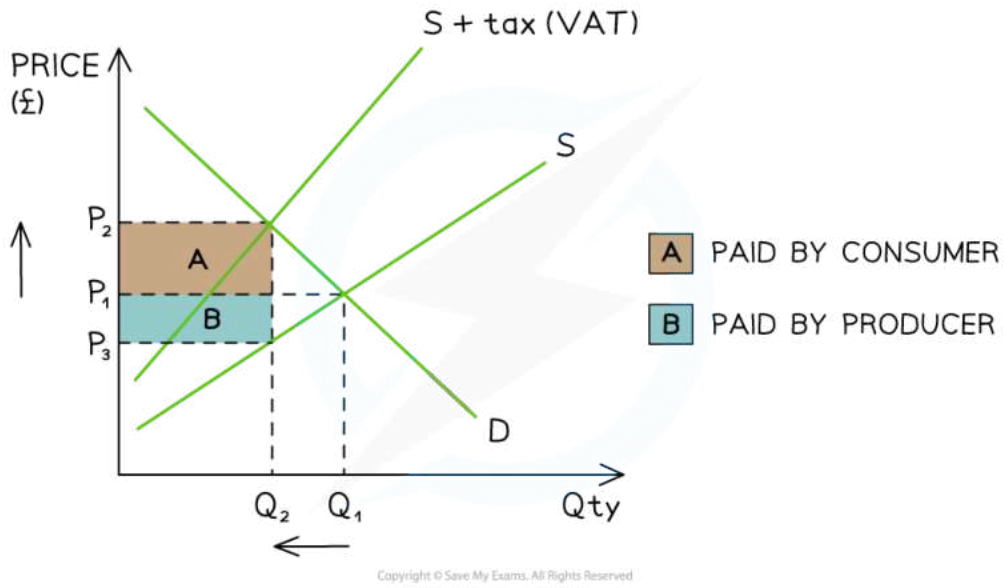
Your notes

Diagram Analysis

- **Initial equilibrium** is at P_1Q_1
- The government places a **specific tax** on a **demerit good**
  - The supply curve shifts left from $S_1 \rightarrow S_2$ by the amount of the tax
- The **price the consumer pays has increased** from P1 before the tax, to P2 after the tax
- The **price the producer receives has decreased** from P1 before the tax to P3 after the tax
- The **government receives tax revenue** = $(P_2-P_3) \times Q_2$
- **Producers and consumers** each pay a share (**incidence**) of the tax
  - The **consumer incidence** (share) of the tax is equal to **area A: $(P_2-P_1) \times Q_2$**
  - The **producer incidence** (share) of the tax is equal to **area B: $(P_1-P_3) \times Q_2$**
- **New equilibrium** is at P_2Q_2
  - Final price is **higher** (P_2) and QD is **lower** (Q_2)
  - If the **decrease in QD** is significant enough, it may force producers to **lay off some workers**

2. Ad Valorem Tax

- A tax that is a percentage of the purchase price e.g. Value added tax (VAT) in Columbia in 2022 was 19%
  - The **more** goods/services consumed, the **larger the tax bill**
  - This causes the second supply curve to **diverge** from the **original** supply curve
  - VAT raises significant **government revenue**



A diagram showing an ad valorem tax (VAT) and the tax incidence for producers and consumers

Your notes

Diagram Analysis

- **Initial equilibrium** is at P_1Q_1
- The government places an **ad valorem tax** to raise government revenue
  - Supply **shifts** left due to the tax from S → S + tax
    - The two supply curves **diverge** as a percentage tax means **more tax** is paid at **higher prices**
- The **price the consumer pays has increased** from P_1 before the tax, to P_2 after the tax
- The **price the producer receives has decreased** from P_1 before the tax to P_3 after the tax
- The **government receives tax revenue** = $(P_2-P_3) \times Q_2$
- **Producers and consumers** each pay a share (**incidence**) of the tax
  - The **consumer incidence** (share) of the tax is equal to **area A: $(P_2-P_1) \times Q_2$**
  - The **producer incidence** (share) of the tax is equal to **area B: $(P_1-P_3) \times Q_2$**
- **New equilibrium** is at P_2Q_2
  - Final price of goods/service is **higher** (P_2) and QD is **lower** (Q_2)

- If the **decrease in QD** is significant enough, it may force producers to **lay off some workers**

Your notes

Examiner Tips and Tricks

When drawing this diagram, students often find it hard to identify the three price points.

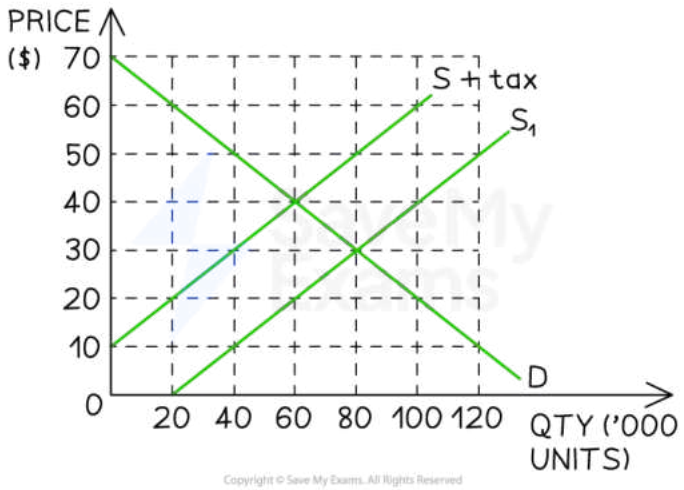
The tax incidence boxes are formed by drawing the new equilibrium quantity through the original supply curve. The three price points are the old equilibrium point, the new equilibrium point - and where the new quantity crosses the original supply curve.

Irrespective if you are dealing with taxes or subsidies, always use the new equilibrium point to determine your incidence boxes.

The consumer incidence is paid from the consumer surplus area and the producer incidence is paid from the producer surplus area.

Worked Example

Refer to the graph below and answer the questions that follow.



Answers:

a) The Government imposes a tax of £20 on a product. Calculate the tax revenue collected by the government [2]

- The per unit tax = £20
- The quantity traded with the tax is 60,000 units
- The total tax revenue gained by the government = £20 x 60,000 units **(1 mark)**
- = £1,200,000 **(2 marks for the correct answer)**

b) Calculate the incidence of tax paid by the producer [2]

- Consumers used to pay £30 for the product
- They pay £40 with the tax - £10 extra
- The tax incidence for consumers = £10 x 60,000 units **(1 mark)**
- = £600,000 **(2 marks for the correct answer)**

c) Calculate the change in consumer spending after the imposition of the tax [2]

- Before the tax, consumers paid £30 for the product and 80,000 units sold
  - Consumer Expenditure = £2,400,000
- After the tax, consumers paid £40 for the product and 60,000 units sold
  - Consumer expenditure = £2,400,000
- There is no change in consumer expenditure **(1 mark + 1 mark for any correct working)**

d) Calculate the deadweight loss caused by the imposition of the tax [2]

- The deadweight loss is the loss of consumer and producer surplus
- It is equivalent to the area of the triangle that forms between the new equilibrium quantity and the old equilibrium quantity

$$= \frac{b \times h}{2} = \frac{80\,000 - 60\,000 \times 40 - 20}{2} \text{ (1 mark)}$$

$$= \frac{20\,000 \times 20}{2} = £\ 200\,000 \text{ (1 mark)}$$

e) Calculate the producer surplus after the imposition of the tax [2]

- Producer surplus is the area above the supply curve but under the price producer receive
- Producers receive £20 as the government receives the balance of the purchase price of £40 which represents the tax
- The producer surplus can be calculated by using the formula to calculate the area of a trapezium

$$= \frac{a + b}{2} \times h = \frac{20\,000 + 60\,000}{2} \times 20 \text{ (1 mark)}$$

$$= £\ 800\,000 \text{ (1 mark)}$$

Your notes

An Evaluation of Indirect Taxes

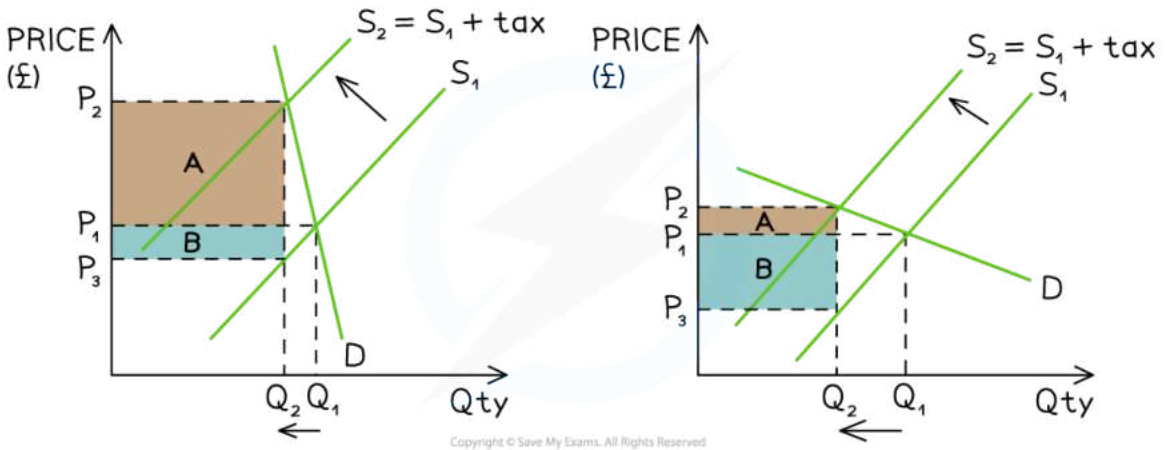
Your notes

The Advantages and Disadvantages of Indirect Taxes

Advantages	Disadvantages
▪ **Raises the price** and reduces the quantity demanded of demerit goods ▪ Reduces **external costs** of consumption and production ▪ **Raises revenue** for government programs	▪ The **effectiveness of the tax** in reducing the use of demerit goods depends on the price elasticity of demand (PED) ▪ Many consumers who purchase products that are price inelastic in demand will **continue to do so** ▪ It may help **create illegal markets** as consumers seek to avoid paying the taxes ▪ Producers may be forced to **lay off some workers** as output falls due to the higher prices

A side by side Comparison of the Impact of PED on Tax Incidence

- **Aiming to maximise their profits,** producers **pass on** as much of the indirect tax as they can to **consumers and** pay the balance themselves
- The amount **passed on** to consumers depends on the **price elasticity of demand (PED)** of the product



A diagram that demonstrates the tax incidence for a product whose PED is inelastic (left) and elastic (right). A is the consumer incidence and B is the producer incidence

Diagram Analysis

1. **In both diagrams**
    - The **specific tax** shifts the **supply curve** from $S_1 \rightarrow S_2$
    - There is a **higher market price** at P_2 and **lower QD** at Q_2
    - **Tax revenue** for the government is the sum of **A+B**
    - **Consumer incidence** is represented by A and **producer incidence** by B
    - **Total revenue** for the seller is calculated using $\mathbf{P_3 X Q_2}$
    - The **difference in PED** results in a **different steepness** to the demand curve

2. **For an inelastic product (e.g. cigarettes)**
    - The curve is steep
    - Producers pass on a much **higher proportion of the tax to consumers** (A) and pay the rest themselves (B)
    - The **QD decreases** ($Q_1 \rightarrow Q_2$) but by a much **smaller proportion** than the increase in **price** ($P_1 \rightarrow P_2$)

3. **For an elastic product (e.g. pizza)**
    - The curve is much flatter
    - Producers pass on a much **smaller proportion of the tax to consumers** (A) and pay the rest themselves (B)
    - The **QD decreases** ($Q_1 \rightarrow Q_2$) but by a much **larger proportion** than the increase in **price** ($P_1 \rightarrow P_2$)

Examiner Tips and Tricks

When asked to ***evaluate*** the impact of a tax in a particular market, it is essential to apply knowledge of PED to the impact it will have on producers, consumers and the government.

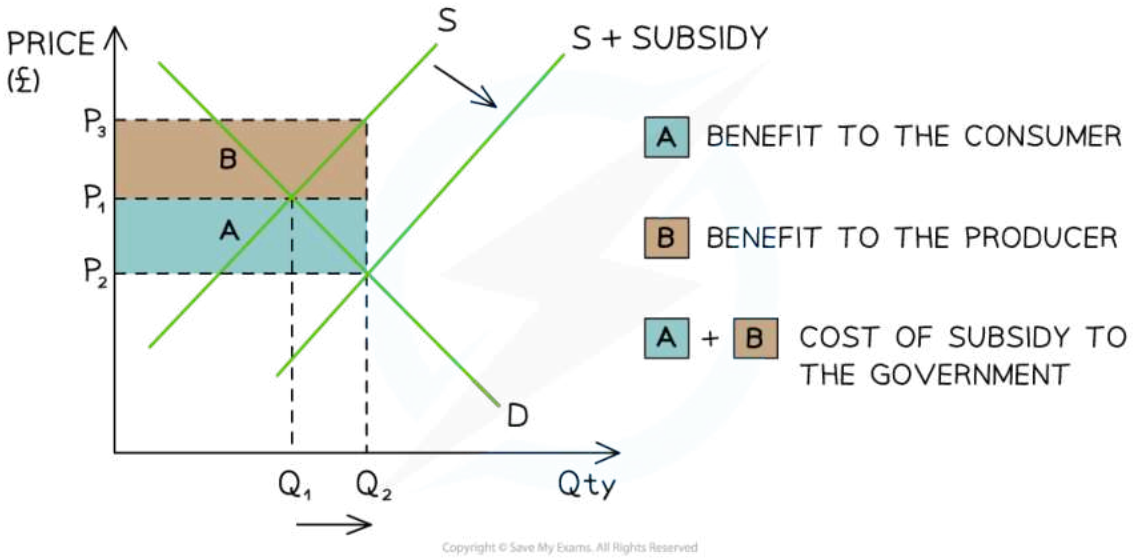
It should be obvious **from the context** if the product in question is **elastic or inelastic in demand**. If not, work through the **factors that determine PED** and make a **judgement** as to whether the product is **elastic or inelastic** in demand. In your answer, explain your reasoning.

Subsidies

Your notes

Your notes

- A **producer subsidy** is a **per unit** amount of money given to a firm by the government
  - To **increase production**
  - To **increase the provision** of a **merit good**
- The way a subsidy is shared between producers and consumers is determined by the **price elasticity of demand (PED)** of the product
  - Producers **keep some** of the subsidy and **pass the rest on** to the consumers in the form of lower prices



A diagram which demonstrates the cost of a subsidy to the government (A+B) and the share received by the consumer (A) and producer (B)

Diagram Analysis

- The original **equilibrium** is at **P_1Q_1**
- The **subsidy** shifts the supply curve from **S → S + subsidy**
  - This **increases the QD** in the market from **$Q_1 \rightarrow Q_2$**
  - The **new** market **equilibrium** is P_2Q_2
  - This is a **lower price** and **higher QD** in the market
- Producers receive **P_2** from the consumer **PLUS** the subsidy per unit from the government
  - Producer revenue is therefore **$P_3 \times Q_2$**

- **Producer share** of the subsidy is marked B in the diagram
- The subsidy **decreases the price** that consumers pay from $P_1 \rightarrow P_2$
  - **Consumer share** of the subsidy is marked A in the diagram
- The **total cost** to the government of the subsidy is **$(P_3 - P_2) \times Q_2$** represented by **area A+B**

Your notes

Examiner Tips and Tricks

Memorise the distinction below as students get very confused when answering questions on subsidies.

When dealing with a **subsidy,** the **producer benefit is now the top portion of the incidence area and consumer incidence is below.** This can be confusing as in all other diagrams, it is the other way around (surplus, indirect tax etc.)

Logically, it makes sense. Producers are given an extra amount of money **for each unit** by the government so this raises the **sales revenue** they receive, while at the same time **lowering the price consumers pay**.

Worked Example

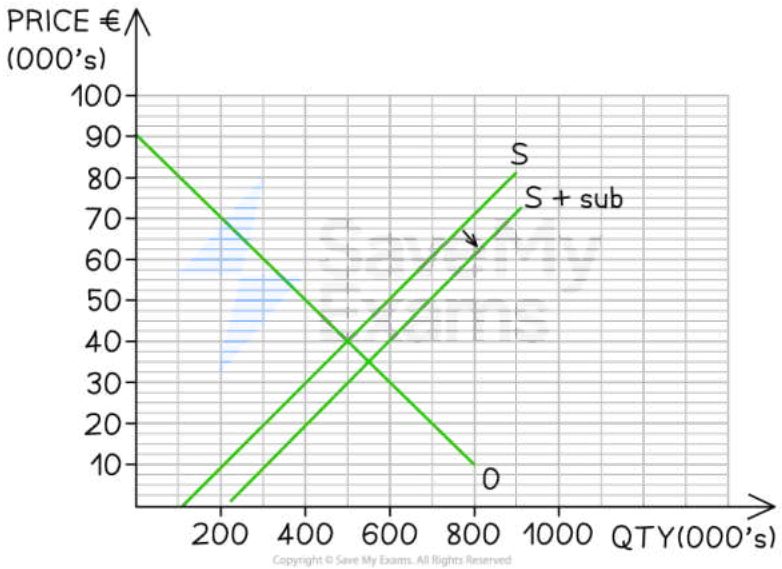
The table below contains the demand and supply schedule for the electric vehicle market in Luxembourg (prior to any subsidies)

Price (€ 000s)	Qd (000s)	Qs (000's)
10	800	200
20	700	300
30	600	400
40	500	500
50	400	600
60	300	700
70	200	800
80	100	900

Your notes

Answers:

a) The government introduces a subsidy of €10,000 per vehicle. Draw the supply and demand graph together with the new curve which includes the subsidy [3]



(1 mark for accurate labels; 1 mark for correctly drawn demand and supply curve; 1 mark for correct shift of supply curve)

b) Calculate the total cost to the government of providing the subsidy [2]

- 550,000 EVs sell with the subsidy **(1 mark)**
- Each EV is subsided at €10,000
- The total cost to the government is €10,000 x 550,000 = €5,500,000,000 **(1 mark)**

An Evaluation of Subsidies

The Advantages and Disadvantages of Producer Subsidies

Advantages	Disadvantages

▪ Can be **targeted** to helping specific domestic industries ▪ **Lowers prices** and increases demand for merit goods ▪ Helps to **change destructive consumer** behaviour over a longer period of time e.g. subsidising electric cars makes them affordable and helps motorists to see them as an option for the masses, not just the wealthy ▪ Can be used to help domestic firms **compete internationally**	▪ Distorts the **allocation of resources** in markets e.g. it often results in excess supply when used in agricultural markets ▪ There is an **opportunity cost** associated with the government expenditure - could the money have been better used elsewhere? ▪ Subsidies are **prone to political pressure** and lobbying by powerful business interests e.g. most oil companies receive subsidies from their respective governments (despite making $billions in profits each year) ▪ Subsidies can disincetivise firms from becoming more efficient or competitive. They provide extra funds which reduce the need to be more competitive

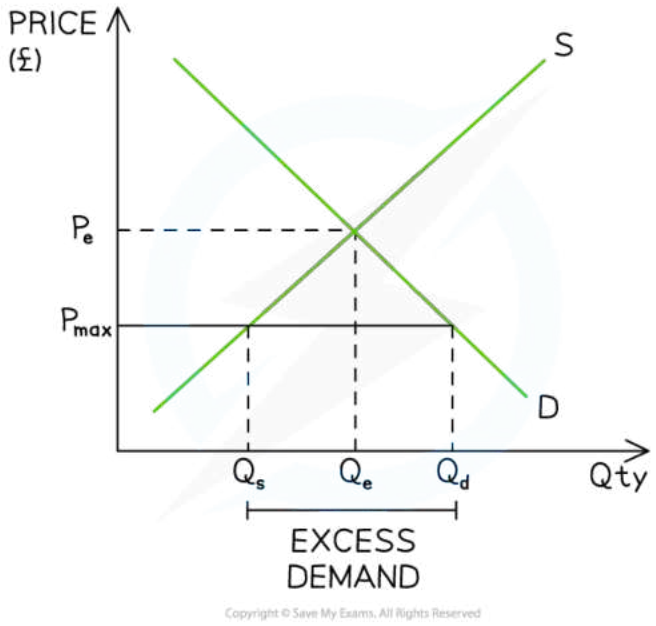

Your notes

2.7.3 Government Intervention: Price Controls, Direct Provision & Regulation

Your notes

Price Ceilings (Maximum Prices)

- **Price controls** are used by governments to influence the levels of production or consumption
- Two types of control are commonly used: maximum price (price ceiling) and minimum price (price floor)
- A **price ceiling** is set by the government **below** the existing **free market equilibrium price** and sellers cannot legally sell the good/service at a higher price
- Governments will often use **price ceilings** in order to help **consumers**
  - Sometimes they are used for **long periods** of time, e.g. to keep rents lower in housing rental markets
  - Other times, they are **short-term solutions** to unusual price increases, e.g. petrol



The price ceiling (P_{max}) sits below the free market price (P_e) and creates a condition of excess demand (shortage)

Your notes

Diagram Analysis

- The initial **market equilibrium** is at P_eQ_e
- A **price ceiling** is imposed at $\mathbf{P_{max}}$
  - The lower price **reduces the incentive to supply** and there is a contraction in quantity supplied (QS) from $Q_e \rightarrow Q_s$
  - The lower price i**ncreases the incentive to consume** and there is an extension in quantity demanded (QD) from $Q_e \rightarrow Q_d$
  - This creates a condition of **excess demand** equal to Q_sQ_d

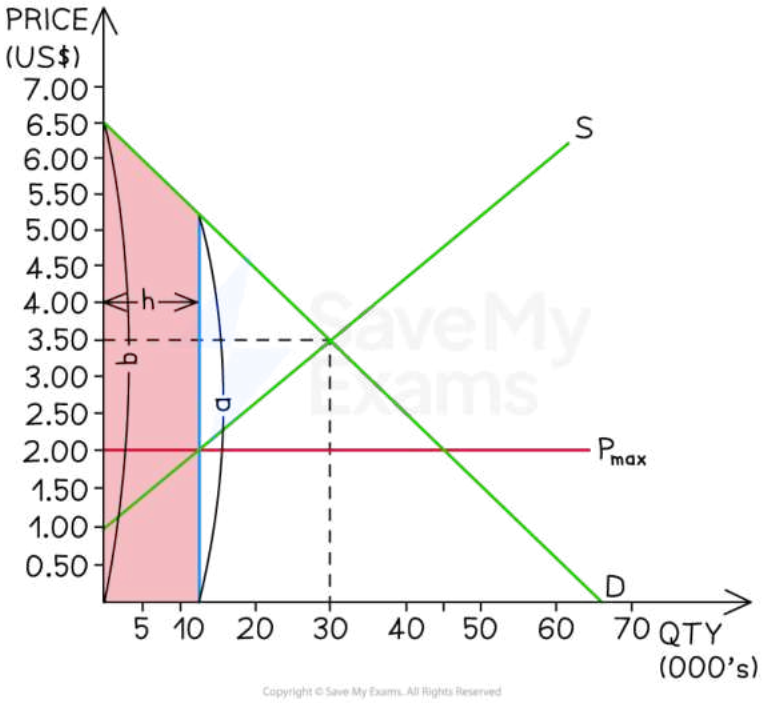
Key points to note on consumer surplus

- When price ceilings are used, they create a condition of excess demand. In the longer term, suppliers will adjust to this situation and supply less (Q_s), so this actually decreases the overall consumer surplus
  - For those individual consumers who are able to purchase the good at the lower price, their consumer surplus increases
  - But many consumers are unable to purchase the product any more, so the overall value of consumer surplus in the market decreases
- To calculate consumer surplus after the price ceiling, using the trapezoid formula often is the quickest way to determine the correct value
  - In the worked example below, there is a visual representation of calculating the area of a trapezoid (shaded pink area) where **a** is the length of one side, **b** the length of the other side - and **h** is the height between the two sides.

Worked Example

In order to support consumers during a two week festive period in Indonesia, the government has set a price ceiling (Pmax) on chicken at $2 per kilogram for this period.

Your notes



Answers:

a) Using the graph, calculate the change in the consumer surplus resulting from this government intervention. [2]

Step 1: Calculate the consumer surplus before the policy

$$\text{Consumer surplus before the policy} = \frac{30{,}000 \times 3.50}{2}$$

$$\text{Consumer surplus before the policy} = \$\,52{,}500$$

(1 mark)

Step 2: Calculate the consumer surplus after the policy

Remember! Theory states that suppliers do not supply past the intersection of Pmax and Qty

Your notes

$$\text{Consumer surplus after the policy} = \text{Area of the trapezoid}$$

$$\text{Consumer surplus after the policy} = \frac{a + b}{2} \times h$$

$$\text{Consumer surplus after the policy} = \frac{6.5 + 5.25}{2} \times 12{,}000$$

$$\text{Consumer surplus after the policy} = \$\,70{,}500$$

(1 mark)

Step 3: Calculate the difference between old and new consumer surplus

The change in consumer surplus = $70,500 - $52,500

= $18,000 **(1 mark)**

b) As this is a short term policy, assuming suppliers continue to meet demand, calculate the change in supplier revenue as a result of this policy. [3]

Step 1: Calculate the original sales revenue

$$\text{Sales revenue} = \text{price} \times \text{quantity}$$
$$\text{Sales revenue} = \$\,3.50 \times 30{,}000 \text{ (1 mark)}$$
$$\text{Sales revenue} = \$\,105{,}000$$

Step 2: Calculate the sales revenue assuming suppliers meet demand

$$\text{Sales revenue} = \text{price} \times \text{quantity}$$
$$\text{Sales revenue} = \$\,2.00 \times 45{,}000 \text{ (1 mark)}$$
$$\text{Sales revenue} = \$\,90{,}000$$

Step 3: Calculate the difference between the two

$$\text{Change in sales revenue} = \$\,90{,}000 - \$\,105{,}000$$
$$\text{Change in sales revenue} = -\$\,15{,}000 \quad \text{(1 mark)}$$

Examiner Tips and Tricks

Remember, when price ceilings are used, they create a condition of excess demand. In the longer term, suppliers will adjust to this situation and supply less, so this actually decreases the overall consumer surplus. For those individual consumers who are able to purchase the good at the lower price, their consumer surplus increases. But many consumers are unable to purchase the product any more, so the overall value of consumer surplus in the market decreases.


Your notes

An Evaluation of Price Ceilings

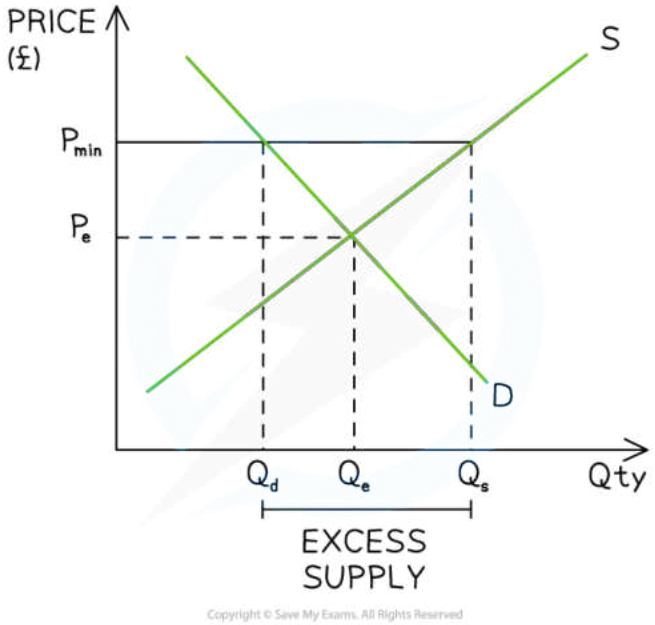
The Advantages and Disadvantages of Using Price Ceilings (Maximum Prices)

Advantages	Disadvantages
▪ **Some consumers benefit** as they purchase at lower prices. For these consumers their **consumer surplus** increases ▪ Price ceilings can **stabilise markets in the short-term** during periods of intense disruption e.g. Covid supplies at the start of the pandemic	▪ Some consumers are **unable to purchase** due to the shortage ▪ Producers lose out as the price is below what they would usually receive: their **producer surplus** falls ▪ The unmet demand usually encourages the creation of **illegal markets** (black/grey markets) as desperate buyers turn to illegal bidding ▪ Maximum prices distort market forces and therefore can result in an **inefficient allocation of scarce resources** e.g. price ceilings of housing rentals in the property market create a shortage ▪ When used in necessity markets, Governments may be forced to intervene further by **supplying the good/service themselves** in order to meet the excess demand

Price Floors (Minimum Prices)

- A **price floor (minimum price)** is set by the government **above** the existing **free market equilibrium price** and sellers cannot legally sell the good/service **at a lower price**

- Governments will often use **price floors** in order to **help producers** or to **decrease consumption of a demerit good** e.g. alcohol



Your notes

The imposition of a price floor (P_{min}) above the free market price (P_e) creates a condition of excess supply (surplus)

Diagram Analysis

- The initial **market equilibrium** is at P_eQ_e
- A **price floor** is imposed at $\mathbf{P_{min}}$
  - The higher price **increases the incentive to supply** and there is an extension in QS from $Q_e \rightarrow Q_s$
  - The higher price decreases **the incentive to consume** and there is a contraction in QD from $Q_e \rightarrow Q_d$
  - This creates a condition of **excess supply equal to $\mathbf{Q_dQ_s}$**

An Evaluation of Price Floors

The Advantages and Disadvantages of Using Price Floors (Minimum Prices) in Product Markets

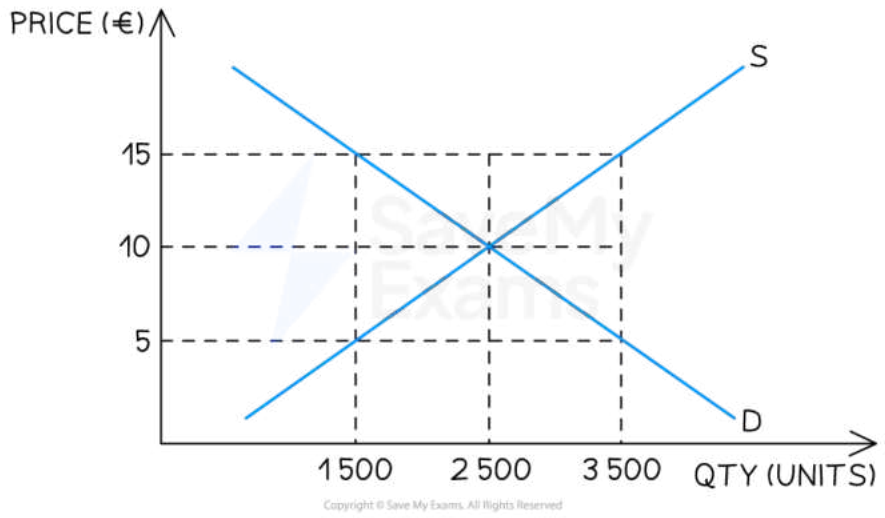
Advantages	Disadvantages
▪ **In agricultural markets,** producers benefit as they receive a higher price (Governments will often purchase	▪ It costs the government to purchase the excess supply and an

the **excess supply** and store it or export it) ▪ When used in **demerit markets, output falls** (Governments will not purchase the **excess supply** of a demerit good) ▪ **Producers** usually **lower their output** in the market to match the QD at the minimum price and this helps to reduce the **external costs**	**opportunity cost** is involved ▪ Farmers may become **over-dependent** on the Government's help ▪ Producers lower output which may result in an **increase in unemployment** in the industry

Your notes

Worked Example

The French government has imposed a minimum price on the market for butter. Refer to the graph below and answer the questions that follow



Answers:

a) From the three price points, identify which price point would represent the price floor [1]

- €15
- (The price floor is always above the market price)

b) Explain the impact on the market of the imposition of this price floor [2]

- It creates a condition of excess supply **(1 mark)**
- With consumers demanding only demanding 1,500 units and producers supplying 3,500 units, the excess supply = 2,000 units **(1 mark)**

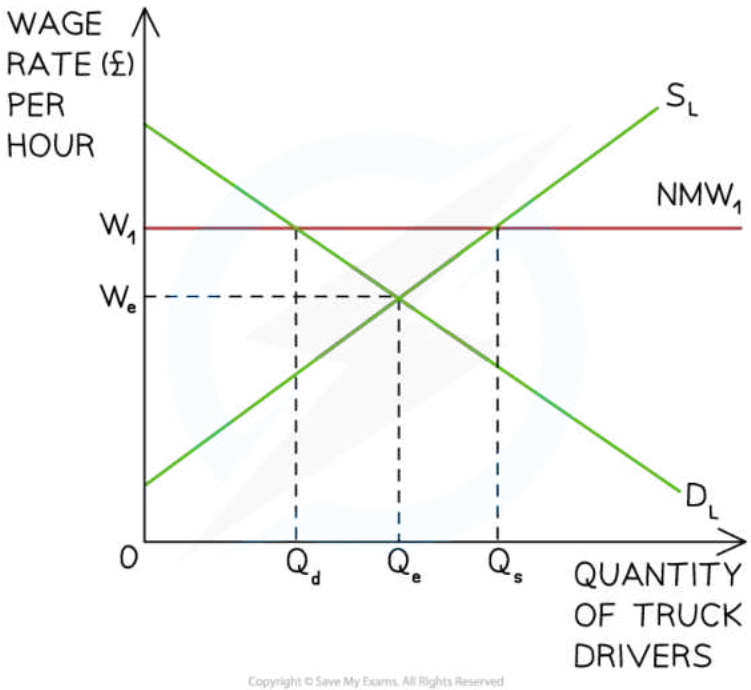
c) Calculate the change in producer revenue after the imposition of the price floor [3]

- Producer revenue before the price floor = €10 x 2,500 = €25,000 **(1 mark)**
- Producer revenue after the price floor = €15 x 1,500 = €22,500 **(1 mark)**
- Producer revenue has decreased by €2,500 **(1 mark)**

Your notes

Price Floors (Minimum Prices) in Labour Markets

- Minimum prices are also used in the **labour market to protect workers** from wage exploitation
- A **national minimum wage (NMW)** is a **legally imposed wage level** that employers must pay their workers
  - It is set **above** the market rate
  - The minimum wage/hour usually varies **based on age**



A national minimum wage (NMW_1) is imposed above the market wage rate (W_e) at W_1

Your notes

Diagram Analysis

- The **demand for labour (D_L)** represents the demand for workers by firms
- The **supply of labour (S_L)** represents the supply of labour by workers
- The **market equilibrium** wage & quantity for truck drivers in the UK is seen at **W_eQ_e**
- The UK government imposes a **national minimum wage** (NMW) at **W_1**
- Incentivised by higher wages, the **supply of labour increases** from Q_e to Q_s
- Facing higher production costs, the **demand for labour** by firms **decreases** from Q_e to Q_d
- This means that **at a wage rate of W_1** there is **excess supply of labour** & the potential for **unemployment** equal to **Q_dQ_s**

An Evaluation of Minimum Wages

The Advantages and Disadvantages of using Minimum Wages in Labour Markets

Advantages	Disadvantages
▪ Guarantees a **minimum income** for the lowest paid workers ▪ Higher income levels help to **increase consumption** in the economy ▪ May **incentivise** workers to be more productive	▪ Raises the **costs of production** for firms who may respond by **raising the price of goods/services** ▪ If firms are unable to raise their prices, the introduction of a minimum wage may force them to lay off some workers **(increase unemployment)**