Edexcel Economics (A)

Theme 1 (2018/19)

Introduction to Markets and Market Failure

Course Companion 4

MARKET FAILURE

Student name: _____ _____

Group: 1___

Teacher: _____ _____ (AT101)

*****PLEASE BRING YOUR COURSE COMPANION ALONG TO ALL LESSONS*****

CONTENTS

1.3.1 Types of market failure

a) Understanding of market failure

b) Types of market failure

- **externalities**
- **under-provision of public goods**
- **information gaps**

What is market failure?

Prices act as signals that help to guide the allocation of resources – a market clearing equilibrium is arrived at.

However, market prices do not always reflect the full costs and benefits associated with market transactions. In other words, the supply and demand curves which underpin the free market equilibrium have been drawn 'in the wrong place'.

When this happens, markets fail to produce the ideal outcomes for society and scarce resources are misallocated – 'allocative inefficiency'* is said to exist. A good may be:

- over-produced and over-consumed because the market price is too low; or
- under-produced and under-consumed because the market price is too high.

This is known as **negative and positive externalities** respectively.

-ve **Pollution of Shell in Nigeria**

Obesity Channel 4 News

Bhopal disaster

+ve **Gender Inequality**

Vaccinations, **Herd Immunity**

Market failure can also occur due to:

i. a lack of profit incentive because it is difficult to charge for some products such as street lighting (**public goods** – so called **'missing markets'** as they would not exist in a pure free market). **The Eddystone Lighthouse;** and

ii. imperfect market knowledge (**asymmetric information**).

* consumer welfare not maximised – by reallocating resources, one or more consumer/s could be made better off without any other consumers becoming worse off.

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1.3.2 (a)+(c) NEGATIVE externalities

a) Distinction between private costs, external costs and social costs

c) Use of a diagram to illustrate:

- **the external costs of production using marginal analysis**
- **the distinction between market equilibrium and social optimum position**
- **identification of welfare loss area**

Definition – EXTERNALITIES are third party effects arising from production and/or consumption of goods and services for which no appropriate compensation is paid. (also known as 'spin-off' or 'spillover' effects)

Externalities exist where markets **fail** to bring the best result for society as a whole i.e. cause a misallocation of resources.

In a transaction within a market, the producer and consumer are the **first and second parties**.

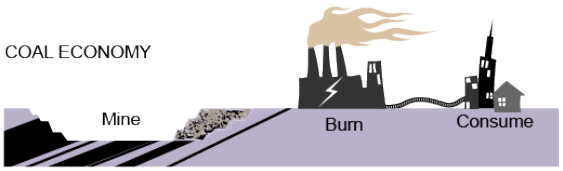
Third parties include any individual, organisation, property owner, or resource that is **indirectly** affected.

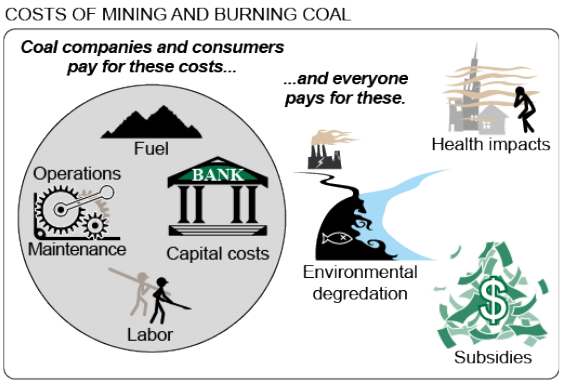
NEGATIVE externalities

A negative externality is said to exist when a third party is **adversely** affected as a result of the actions/decisions taken by another individual/firm/organisation. In more technical terms, an **external cost** is said to be imposed on a third party.

For example, a coal-fired power station will incur the **private** costs of raw materials (coal), wages, running costs etc. but will also impose costs on third parties such as the visual impact of an ugly building ('blight'), poor air quality affecting the health of nearby residents and the impact of acid rain on forests and lakes in other countries. These costs may be particularly hard to quantify and may be very long-term in nature.

Case study: Fawley oil refinery





There is a large ExxonMobil oil refinery in Fawley, on the western shore of Southampton Water. It is the largest refinery in the UK and one of the most

complex in Europe. Situated on Southampton Water, it has a mile-long marine terminal that handles around 2,000 ship movements and 22 million tonnes of crude oil and other products every year. The refinery processes around 270,000 barrels of crude oil a day and provides 20 per cent of UK refinery capacity.

Output: Jet fuel, petrol, diesel, lubricating oil, fuel oil, various chemicals

Annual production capacity:

• Up to 330,000 barrels of crude oil processed each day (15 million tonnes per year)

• Over 850,000 tonnes of chemical products produced each year

Number of workers on site: Over 2,300

http://www.exxonmobil.co.uk/UK-English/about_what_refining_fawley.aspx

https://www.youtube.com/watch?v=9NPybiniccw

http://www.dailyecho.co.uk/news/8845881.__1m_Fawley_claim_fails/

Questions:

1. Identify a major group of people who you might class as being the 'third party'. Explain why.

2. Identify and explain two costs to producers of running the Refinery

3. Identify and explain two external costs to third parties of the Refinery

By summing the private cost (to the firm) and the external cost (to third parties) we arrive at the social cost (to society as a whole):

Social Cost = Private Cost + External Cost

Plastic pollution: One town smothered by 17,000 tonnes of rubbish

By Yvette TanBBC News, Jenjarom; 13 February 2019
https://www.bbc.co.uk/news/world-asia-46518747

Diagrammatic (marginal) analysis of NEGATIVE <u>production</u> externalities

As you will fully appreciate in Theme 3, the concept of 'at the margin' is a very powerful one in economics. Marginal analysis is all about studying the impact on one variable of an incremental change in another (e.g. the additional revenue gained or cost incurred from producing **one extra unit** of output); also see elasticity.

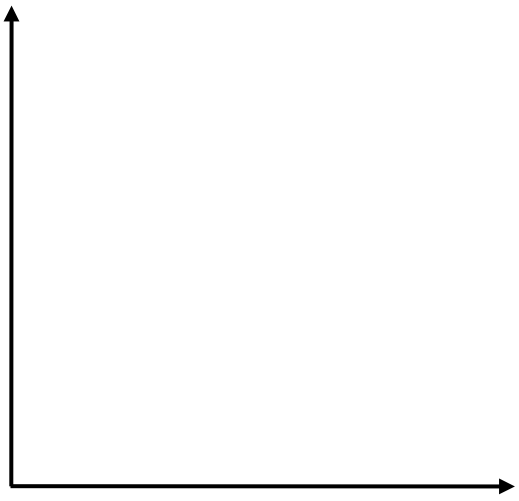
In deciding how much of a particular good/service to supply, a (profit-maximising) firm will take into account its (internal) costs of production relative to the price (or average revenue) it is likely to receive. It is assumed that, provided the price is at or above the cost of producing the last unit (the Marginal Private Cost or MPC) then the firm is willing to supply. So for now, in the context of externalities, we will refer to the firm's 'perceived' supply curve as the Marginal Private Cost curve (which is thought to slope upwards like the supply curve as the cost of producing additional units is assumed to increase – see Theme 3 notes on 'diminishing marginal returns').

Marginal Private Cost (MPC): the cost to the firm of producing an additional unit of output.
Marginal External Cost (MEC): the cost to third parties of the firm producing an additional unit of output.
Marginal Social Cost (MSC) also known as 'true' supply = MPC + MEC

In this situation, the **marginal social cost** of production will be greater than the **marginal private cost** of production (i.e. MSC > MPC). This leads to the good or service being over-produced and over-consumed relative to the social optimum. Without government intervention the good or service will be under-priced and the negative externalities will not be taken into account. There will be a **deadweight loss of economic welfare**. Therefore, in terms of welfare, markets over-produce goods that generate external costs. So the government may need to intervene to reduce the welfare loss to the point where the marginal social cost = marginal social benefit.

On the axes below:

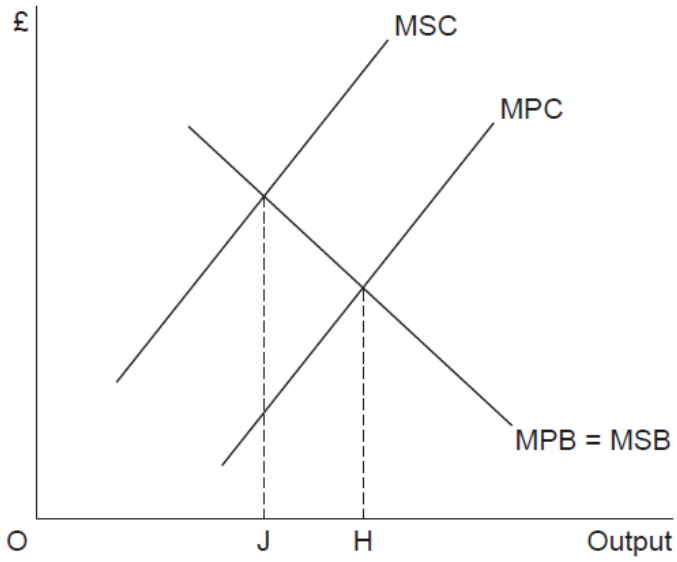
i. Label the axes
ii. Sketch on the MPC=S_{FIRM} and MSC=S_{TRUE} curves
iii. Identify the MEC – what happens to this as output rises?
iv. Sketch on the Marginal Private Benefit = Marginal Social Benefit = Demand curve (downward-sloping, left to right) – to be explained on pp17/18
v. Identify the allocatively efficient = socially optimal market clearing equilibrium quantity (Q_{SO}) where MSC=MSB, and the free market equilibrium (Q_{FM}) where MPC=MPB
vi. Shade in the **welfare loss** triangle caused by being at free market equilibrium rather than social optimum (where MSC>MSB)



In keeping with any credible GCSE science experiment, we are only changing one variable at a time!

Questions:

1(a) The diagram below shows the marginal private and social benefit (MPB and MSB) curves and the marginal private and social cost (MPC and MSC) curves for a good which generates negative externalities in production.



In the absence of government intervention, a misallocation of resources is likely to occur because

A there is underconsumption of JH.

B market output is too low.

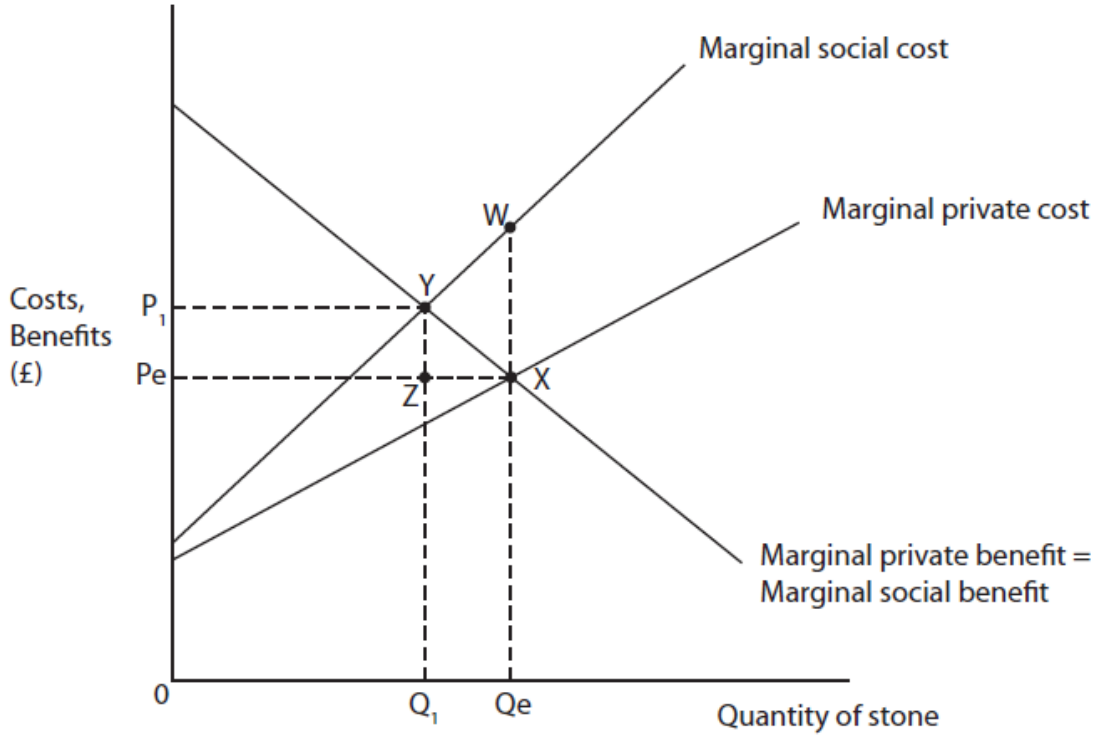
C market price is too high.

D there is overproduction of JH.

1(b) Explain TWO likely negative externalities caused by the decision to allow the building of a third runway at Heathrow Airport. (4)

2(a)

2(b)



Data

The diagram shows the market for the extraction of stone from a quarry. Assume there are no external benefits.

Which of the following is true?

(1)

A The social optimum quantity exceeds the free market equilibrium quantity

B The area of welfare loss at the free market equilibrium is XZY

C A decrease in the quantity from Qe towards Q1 will reduce the net welfare loss

D At the free market equilibrium quantity, marginal social benefit exceeds marginal social cost

Answer ☐

Response question 1

Extract 1 EU and mackerel fish quotas

North Atlantic fish stocks are collapsing through mismanagement by governments. A breakdown in the agreement over the size of fish catches between the European Union (EU), Norway, Iceland and the Faroe Islands means the last great stock of mackerel is under threat. The quantity of mackerel caught has risen by almost 50% this year and is now well beyond the level required to remain a sustainable resource. If mackerel disappear, so do the many links in the food chain which depend on them. The fish catches need to be small enough to maintain breeding stocks for future generations.

Global warming has caused mackerel to migrate further north to the seas around Iceland and the Faroe Islands and these two countries are massively exceeding the agreed fish catches, known as quotas. Both of these non-EU countries are catching over 150 000 tonnes of mackerel this year – over-fishing in excess of their agreed limit of 100 000 tonnes – whilst the EU countries have maintained their fish catches. More than a third of the mackerel caught by Icelandic fishing boats is fed to animals and farmed fish or turned into fertiliser. It is an astonishing waste. Other fish stocks in Iceland's waters such as whiting and herring have been wiped out.

To make matters worse, the EU fish quota system means that over 30% of fish catches are thrown back into the sea. Fishing boats are not allowed to land or sell more than their allowances, otherwise they risk severe fines.
(Source: adapted from George Monbiot, © Guardian News and Media Ltd, 8th August 2011)

Examine the likely external costs from over-fishing of mackerel. Use an appropriate diagram in your answer. (15)

Plan:

Data Response question 2

Extract 2 Environmental damage from bottled water

Water is a precious resource. Governments should ensure the sustainability of safe water supplies for the benefit of all people and the natural environment. The use of bottled water is harmful to the environment. Three litres of water are used directly or indirectly in the production of one litre of bottled water. The majority of bottles are made of plastic and end up in landfill sites rather than being recycled. Furthermore, vast amounts of plastic waste never reach the recycling plants and end up in the oceans, killing fish and birds who mistake it for food. It takes up to a thousand years for plastic to decompose and so the problem is set to get worse. Bottled water is often transported hundreds of miles from its origin to shops and consumers, at considerable carbon cost. By contrast, tap water only takes a little energy to pump along pipelines into homes. Bottled water is also expensive and consumers can pay anything up to 10 000 times more than if they just drank tap water. Studies have shown that tap water is generally just as clean and healthy as bottled water, if not more so. Furthermore, over half of the bottled water in the UK comes from purified tap water. It is time for the government to intervene by increasing the indirect tax on bottled water.

Questions:

With reference to the concept of external costs, discuss the possible economic effects of an increase in the production and consumption of bottled water. (15)

Evaluate the likely economic effects of an increase in indirect tax on bottled water. Use a supply and demand diagram in your answer. (15)

Exercise:

Air pollution 'causing deadly public health crisis' December 2014

Read the following article from the BBC website:

I. Make notes on the costs to society ***and*** on the suggested government action to help reduce the damage caused by air pollution.
II. Illustrate with the relevant externalities diagram.

New schools, care homes and hospitals should be built far away from major roads because of the dangers of air pollution, a report by MPs says. The Environmental Audit Committee argues air pollution is a "public health crisis" causing nearly as many deaths as smoking. It also suggested a scrappage scheme for diesel cars to cut emissions.

There are an estimated 29,000 deaths annually in the UK from air pollution. Nitrogen dioxide is known to cause inflammation of the airways, reduce lung function and exacerbate asthma. Particulate matter - tiny invisible specks of mineral dust, carbon and other chemicals - are linked to heart and lung diseases as well as cancer.

Joan Walley, the committee chairwoman, told the BBC: "There is a public health crisis in terms of poor air quality. There are nearly as many deaths now caused by air pollution as there are from smoking, so the main thing is we stop a new generation of children being exposed." She said government "should make it impossible" for new schools, care home or health clinics to be built in pollution hotspots.

The committee's report says traffic is responsible for 42% of carbon monoxide, 46% of nitrogen oxides and 26% of particulate matter pollution. It said government had promoted diesel vehicles as they produced less of the greenhouse gas carbon dioxide. But the committee said diesel was now seen as "the most significant driver of air pollution in our cities".

They called for government to pay for diesel drivers to upgrade their engines or for a national scrappage scheme to take the most polluting vehicles off the road.

Other measures suggested include:

- The Met Office and BBC producing high pollution forecasts alongside ones for pollen and UV.
- A national plan for "low emission zones" to tackle heavily polluting vehicles, like **the one in London**.
- Changes to fuel duty to encourage low nitrogen dioxide vehicles as well as low carbon dioxide.
- Financial incentives for alternative fuels.
- Encourage walking and cycling as the "ultimate low emission" option

The British Lung Foundation said the recommendations "may seem drastic", but air pollution was so bad they were necessary "to protect the nation's health. Our dirty air will simply not clean itself, and this issue is one that will, without the government's intervention, continue to impact on current and future generations," said Dr Penny Woods, the charity's chief executive.

Simon Gillespie, the chief executive of the British Heart Foundation, said: "The government cannot continue to ignore this issue. Enough is enough. The government must act on these recommendations quickly if we are to improve the quality of the air we breathe and protect the nation's heart health."

A government spokesperson said there would be a full response to the report in the future, but added: "Clean air is vital for people's health and, while air quality has improved significantly in recent decades, we are investing heavily in measures across government to continue this, committing £2bn since 2011 in green transport initiatives."

Notes and diagram:

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1.3.2 (b)+(d) POSITIVE externalities

b) Distinction between private benefits, external benefits and social benefits

d) Use of a diagram to illustrate:

- **the external benefits of consumption using marginal analysis**
- **the distinction between market equilibrium and social optimum position**
- **identification of welfare gain area**

External benefits (positive externalities) exist when the benefits to society of an economic transaction are greater than to the individual consumer of the good or service, in other words there are additional benefits to third parties. For example, the benefit to an individual of a vaccination includes the reduced risk of illness, a healthier life, greater ability to work and earn, and a longer life. Others may also benefit as they are less likely to catch the disease and society will benefit from lower general health care costs, plus enhanced tax revenue into (healthier) old age. In a similar vein to the negative externalities formula:

Social benefits = private benefits + external benefits

Case study: Vaccination. A drop of pure gold *The Economist 13.10.2015*

WHAT good is vaccination? Obviously it is good for the person receiving the vaccine, if he is thus prevented from suffering from a nasty disease. More subtly, it can be good for an entire population since, if enough of its members are vaccinated, even those who are not will receive a measure of protection. That is because, with only a few susceptible individuals, the transmission of the infection cannot be maintained and the disease spread. But in the case of many vaccines, there are non-medical benefits, too, in the form of costs avoided and the generation of income that would otherwise have been lost. These goods are economic. Quantifying these more general benefits is hard. But a pair of researchers from Harvard University has just tried. David Bloom and David Cannin have looked at two vaccination programmes and attempted to calculate the wider benefits.

The first benefit was that healthy children are more likely to attend school and better able to learn. The second was that healthy workers are more productive. Both of these seem fairly obvious. Two other benefits are less so, however.

One is that good health promotes savings and investment. This is because healthy people both expect to live longer (which gives them an incentive to save) and actually do live longer (which gives them more time to save). The other is that good health—and, particularly, expectations about the good health of one's offspring—promotes the so-called demographic transition from large to small families that usually accompanies economic development.

Question:

Explain TWO of the external benefits of vaccinations

Case study: Education

	INDIVIDUALS	SOCIETY
COSTS	**Direct costs** Transport, books, uniform (including school fees) **Forgone production** Lost earnings or other production	**Cost of provision** of public sector education- buildings, teachers etc.
BENEFITS	**Increased productivity** as reflected in earnings or other work outputs **Other private benefits** (better personal health, expanded capacity to enjoy leisure, increased efficiency in job search and other personal choices)	**Spillover effects in worker productivity** - when a person's education enhances the work productivity of his or her co-workers **Expanded technological possibilities** -such as those arising from the discovery, adaptation and use of new knowledge in science, medicine, industry, and elsewhere **Community benefits** -greater social equity, more cohesive communities, stronger sense of nationhood, slower population growth and related alleviation of environmental stress, reduced risks from infectious diseases, crime reduction, and so on

Question: Explain **THREE** of the external benefits of education

1

2

3

Diagrammatic (marginal) analysis of POSITIVE <u>consumption</u> externalities

Marginal Private Benefit (MPB): the benefit to a firm/individual of consuming an additional unit as shown by its own 'perceived' demand curve (see explanation on p18).

Marginal External Benefit (MEB): the benefit to third parties of consuming an additional unit.

Marginal Social Benefit (MSB): also known as 'true' demand = MPB + MEB

In this situation, the **marginal social benefit** of consumption will be greater than the **marginal private benefit** of consumption (i.e. MSB > MPB). This leads to the good or service being under-consumed relative to the social optimum. Without government intervention the positive externalities will not be taken into account. There will be a **deadweight loss of economic welfare** or a **welfare gain** if more is consumed. Therefore, the government may need to intervene to ensure that marginal social cost = marginal social benefit.

Exercise:
Suggest what types of government intervention might be appropriate for positive externalities and to achieve the social optimum level of provision.

On the axes below:

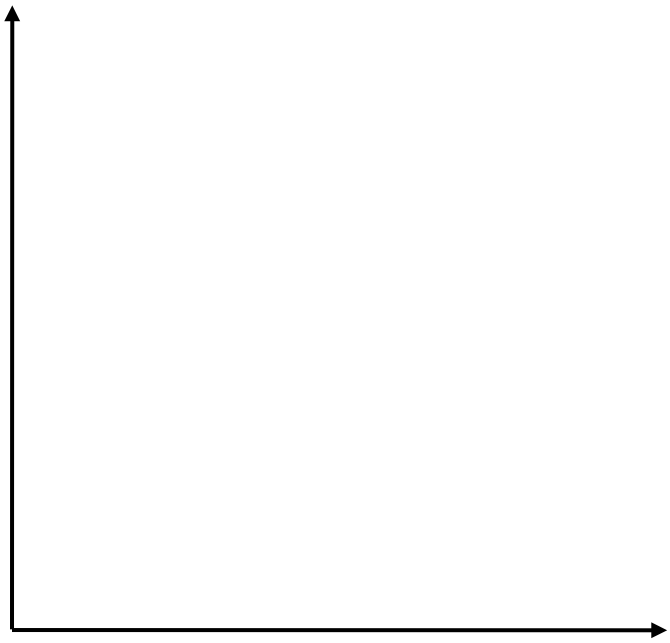
i. Label the axes
ii. Sketch on the MPB=D_{CONS} and MSB=D_{TRUE} curves
iii. Identify the MEB – what happens to this as output rises?
iv. Sketch on the Marginal Private Cost = Marginal Social Cost = Supply curve (upward-sloping, left to right) – see brief explanation above on p7
v. Identify the allocatively efficient = socially optimal market clearing equilibrium quantity (Q_{SO}) where MSC=MSB, and the free market equilibrium (Q_{FM}) where MPC=MPB
vi. Shade in the **welfare loss** (or potential gain if output increased) triangle caused by being at free market equilibrium rather than social optimum (where MSB>MSC)

In keeping with any credible GCSE science experiment, we are only changing one variable at a time!

ADDENDUM

Marginal benefit/utility – an overview (using existing knowledge)

The **demand curve** (as you should already know) reflects the price that consumers are willing to pay for a given quantity of a good or service, ceteris paribus. We also know that the price is a reflection of the *valuation* that consumers place on the product in that quantity according to the benefit or utility they stand to gain from consuming. However, it is in fact the *marginal* (or last consumer) who dictates the price for everyone else, including those that placed a higher valuation on the good or service. This can be explained using the principle of **consumer surplus** as follows:

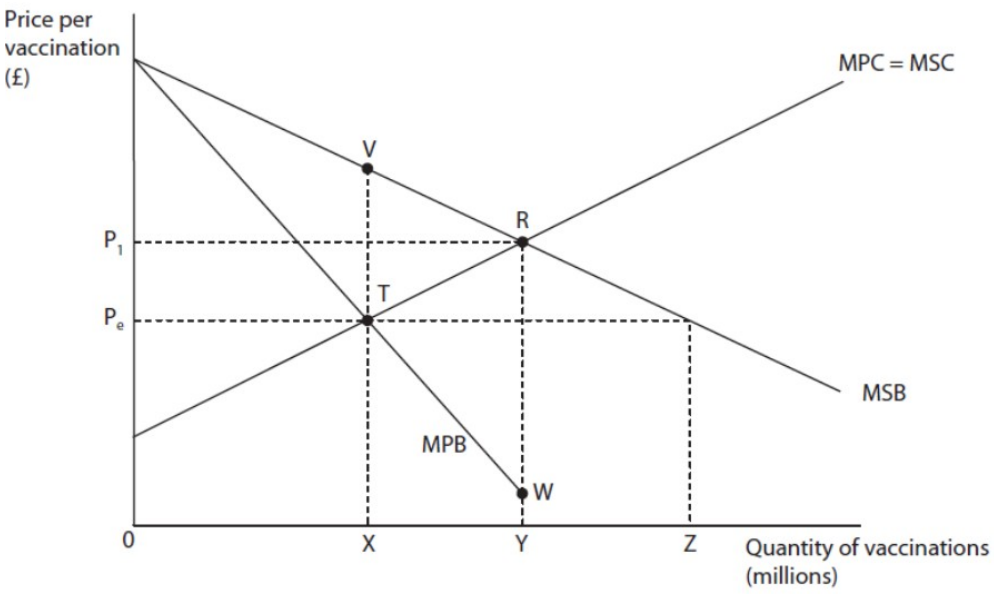


Let's assume we line up all our consumers according to what they are willing to pay for one unit of a good or service, from the highest valuation on the left to the lowest valuation on the right in accordance with the utility/benefit they derive from the product. Individual 1 values the product at £10; individual 2 values the product at £9; individual 3 at £8 and so on. From this we can derive the demand curve, sloping down left to right as we would expect. However, note that, despite individuals 1&2 valuing the product above £8, they still only end up paying £8 (or less if we add more individuals) as firms charge all consumers the same price for the same product (assuming no 'price discrimination' – see Theme 3, Monopoly). This is great news for individuals 1&2 as they end up paying less than the price they are willing to pay; not so good for the firm as the consumer surplus triangle (between the market clearing price and the demand curve) represents 'untapped' revenue. In other words, it is the last (or marginal) consumer's valuation/benefit/utility which determines the price everyone will end up paying, hence the term MARGINAL BENEFIT.

(You may also wish to consider the benefit or utility you derive from gradually increasing your consumption of a particular product – e.g. chocolate. Despite the first few bites/bars being most enjoyable/satisfying, as you eat more and more you may start to feel sick/uncomfortable…..i.e. your marginal benefit/utility starts to diminish and the price you would be willing to pay for additional chocolate starts to fall accordingly).

Questions:

Market for vaccinations



The diagram shows a free market for vaccinations in which the current equilibrium level of output is X and price P_e. At this level of output there is

(1)

A an external cost

B market failure

C an excess supply

D government failure

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1.4.1 Government intervention in markets *(to reduce NEGATIVE externalities)*

(a) (i) indirect taxation (*ad valorem* and specific)
(b) (i) trade pollution permits
(iv) regulation

INDIRECT TAXATION

The economist Pigou recommended the use of an indirect tax to account for externalities and 'internalise' the externality i.e. raise the price and reduce output of the good to achieve the social optimum. " a tax levied upon each unit of pollution in an amount just equal to the marginal damage it inflicts upon society at the efficient level of output."

Definition: An **indirect tax** is imposed on producers (suppliers) by the government, in contrast to direct taxes, such as income and corporation tax, which are levied on incomes of households and firms. Indirect taxes are also called expenditure taxes.

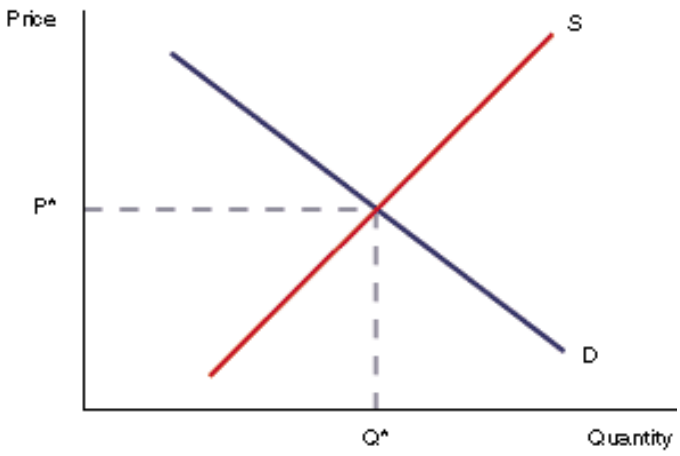
Indirect taxes are imposed on expenditure. They raise the costs to the firm and shift the supply curve to the left. The vertical difference between the two supply curves measures the amount of tax charged.

Types of Indirect Tax

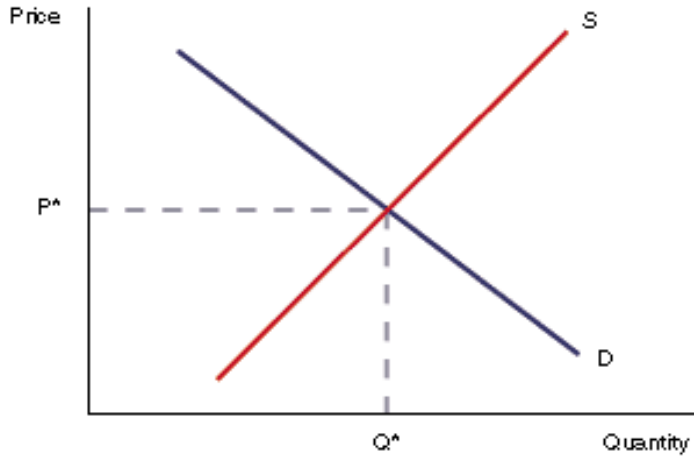
- *Ad valorem* tax – a tax levied as a percentage of the value of the good. Most goods have a 20% VAT charge.
- Specific or Unit tax – tax levied on volume, e.g. excise duties. The amount of tax levied does not change with the value of the goods but with the amount or volume of the goods purchased, e.g. excise duties on alcohol, tobacco and petrol.

1. Draw an *ad valorem* tax and a specific tax on the diagrams below:

***Ad Valorem* Tax**



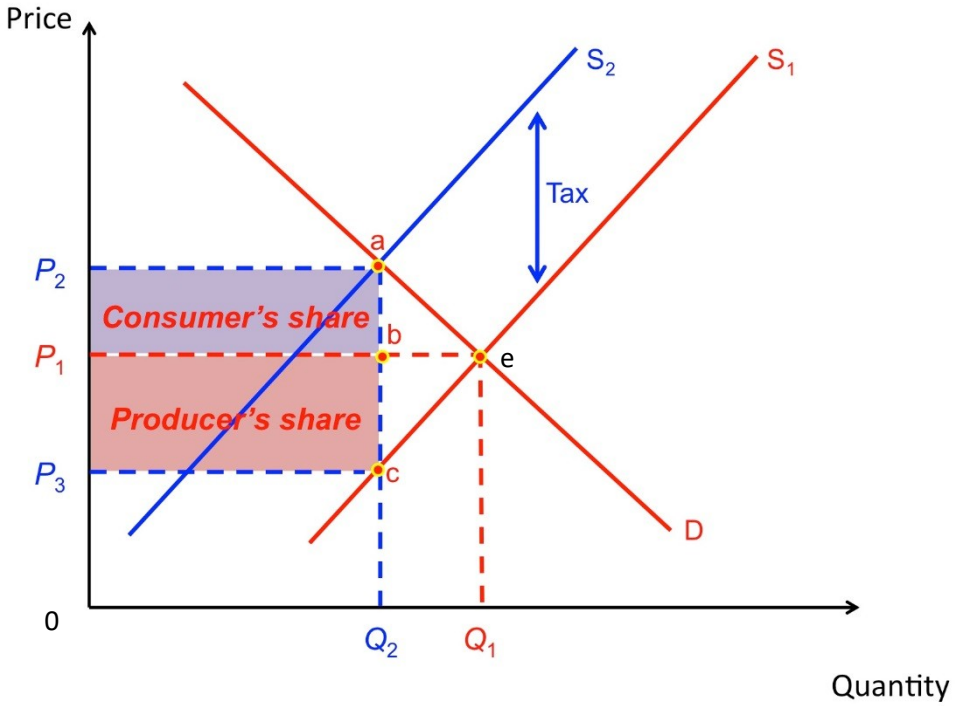
Specific/Unit Tax



Explain why an *ad valorem* tax is drawn at an angle to the original supply curve.

The Incidence of Tax

The incidence of tax is the tax burden on the taxpayer. The incidence of tax falls partly on the consumer and partly on the producer.



1) What is the original price?

2) What is the effect of the tax on the supply curve? Is it specific or *ad valorem*?

3) In this example, what is the actual price increase to consumers?

4) What is the total tax area received by the government?

5) How much of this tax is paid by a) consumers? b) producers?

6) What was the original revenue for producers before the tax?

7) What was the revenue for producers after the imposition of the tax?

Indirect Tax Recap Questions

1) What is an indirect tax?

2) Give 2 examples of indirect taxes

3) Why are indirect taxes levied by the government?

4) What is the current standard rate of VAT?

5) Calculate the VAT on a £5 box of chocolates £…….. total price £……..

6) Calculate the VAT on a £500 bottle of champagne £…….. total price £……..

7) Use a model to explain what impact an indirect tax will have on a supply curve.

8) What does the vertical distance between the two supply curves represent?

9) Using examples, explain the difference between a specific tax and an *ad valorem* tax?

10) A firm may try to pass on some or all of the tax onto the consumer through a higher price. This is known as shifting the burden of the tax. What impacts a firm's ability to do this?

Indirect Tax & elasticity

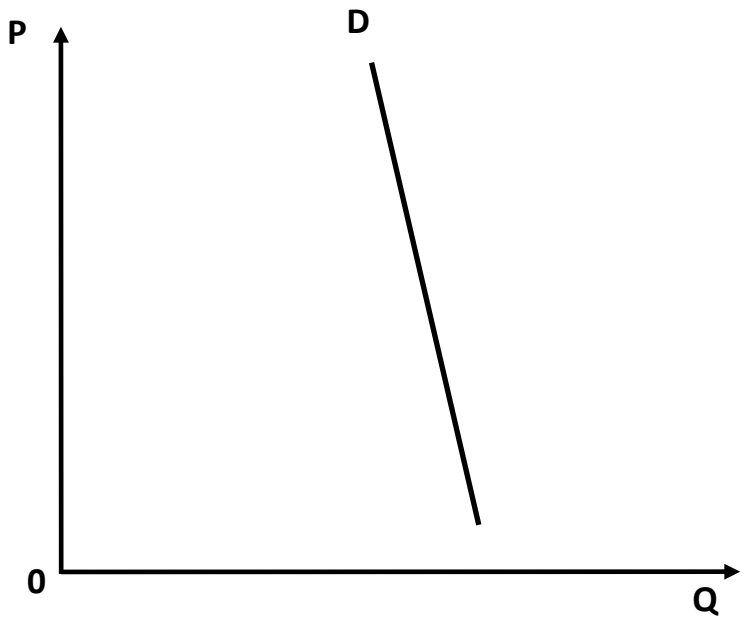
The extent to which the tax incidence falls on consumers rather than producers depends on the elasticity of demand and supply. Using your demand & supply analysis on pp25-26, complete the table below:

Elasticity	**Consumer incidence (high/low)**	**Producer incidence (high/low)**
Demand inelastic		
Demand elastic		
Supply inelastic		
Supply elastic		

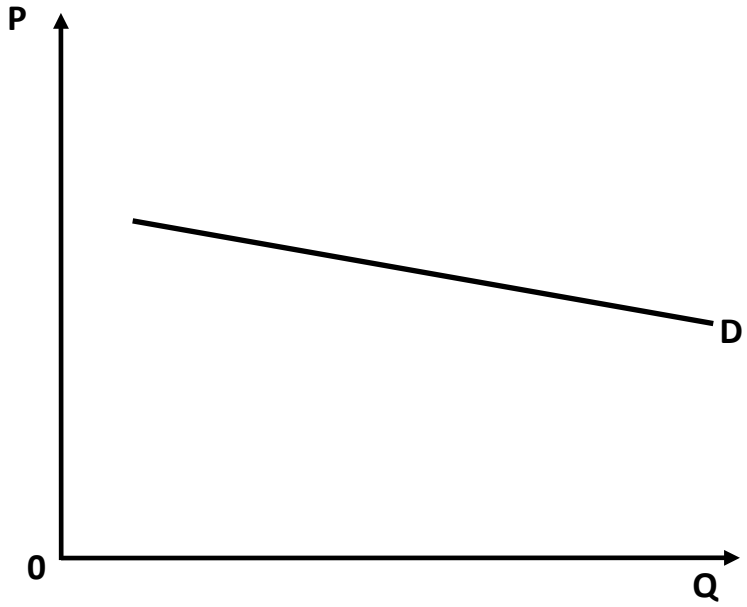
PED – inelastic vs elastic – class activity:

1. Draw a supply curve (roughly 45 degrees) on each diagram and then draw on a specific / unit tax.
2. Identify the total incidence of tax.
3. Identify the tax burden on the producer.
4. Identify the tax burden on the consumer.
5. What difference do you observe?

Inelastic demand



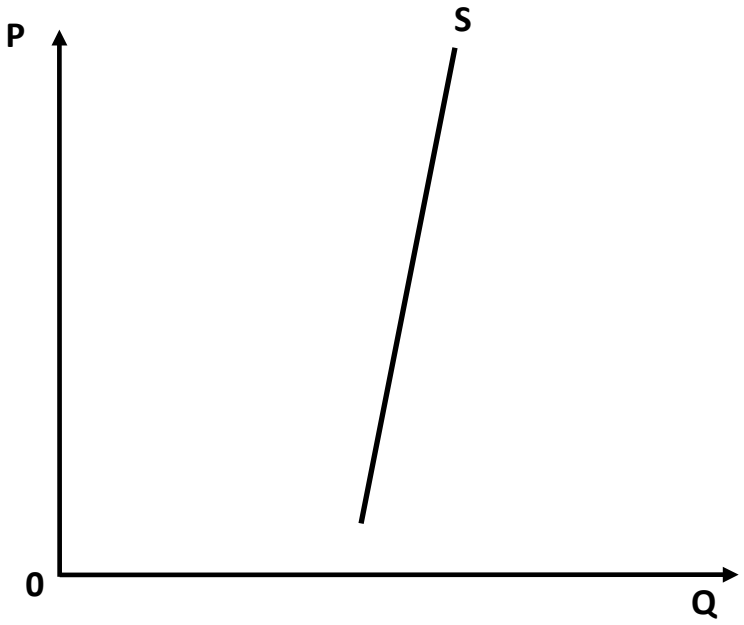
Elastic demand



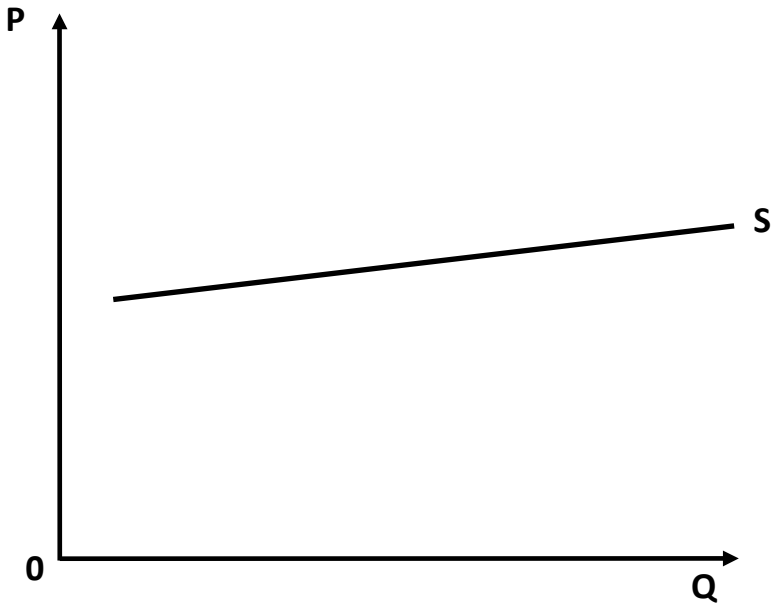
PE<u>S</u> – inelastic vs elastic – class activity:

1. Draw a demand curve (roughly 45 degrees) on each diagram and then draw on a specific / unit tax.
2. Identify the total incidence of tax.
3. Identify the tax burden on the producer.
4. Identify the tax burden on the consumer.
5. What difference do you observe?

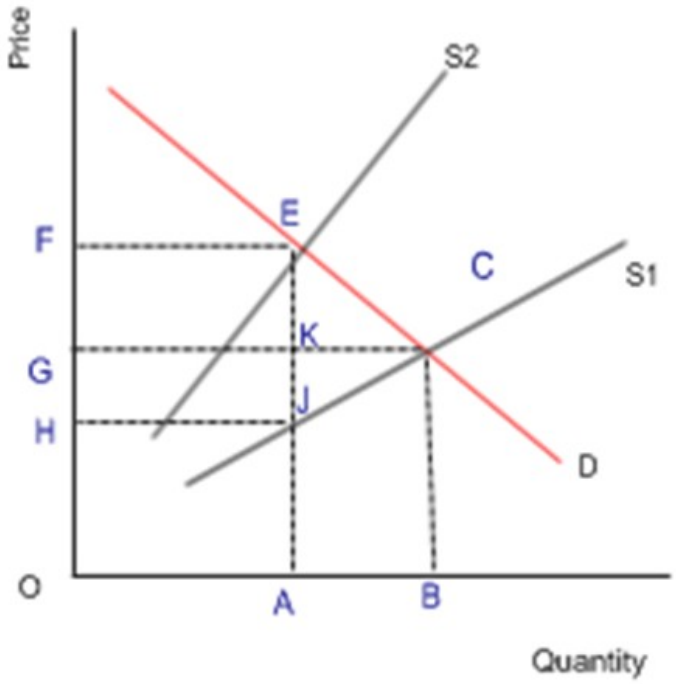
Inelastic supply



Elastic supply



Activity 1



Original equilibrium price and quantity

▶ OG,OB

New equilibrium price and quantity

▶

Total area of tax paid by consumers

▶

Total area of tax paid by producers

▶

Total tax revenue of the government

▶

The change in producer's revenue

▶ OBCG - OAJH

Change in consumer's expenditure

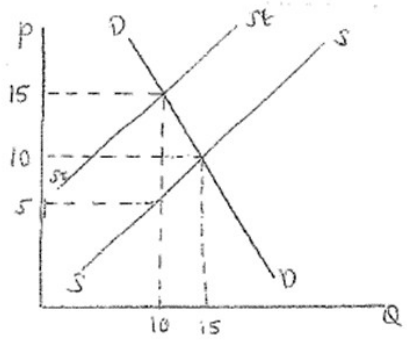
▶

Is this a specific or ad valorem tax?

Activity 2 (Note Quantity is in 1000's)

Activity 2

In the diagram, SS shows the supply curve for whisky without an indirect tax and StSt the Supply curve for whisky which includes a **specific** indirect tax imposed by the government.



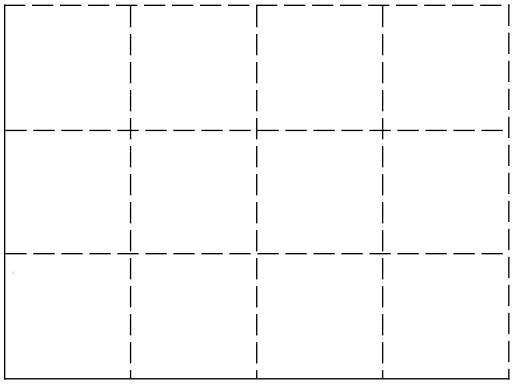
Identify:

1. The total amount spent on whisky before tax is imposed?
2. The total amount spent by consumers after tax is imposed?
3. The total tax revenue?
4. The amount of tax paid by consumers?
5. The amount of tax paid by producers
6. What is the value of price elasticity of demand for whisky?

Activity 3

Price (£)	Quantity demanded	Quantity supplied
4	16	4
6	12	6
8	8	8
10	4	10
12	0	12

1) Draw the demand and supply curves from the data above on graph paper.



2) What is the equilibrium quantity demanded and supplied?

The government now imposes a specific tax of £3 per unit

3) Show the effect of this on the diagram

4) What is the new equilibrium QD and QS?

5) What is the new equilibrium price?

6) What is the incidence of tax per unit on (i) the consumer and (ii) the producer?

7) What is (i) the tax per unit and (ii) total government revenue from the tax?

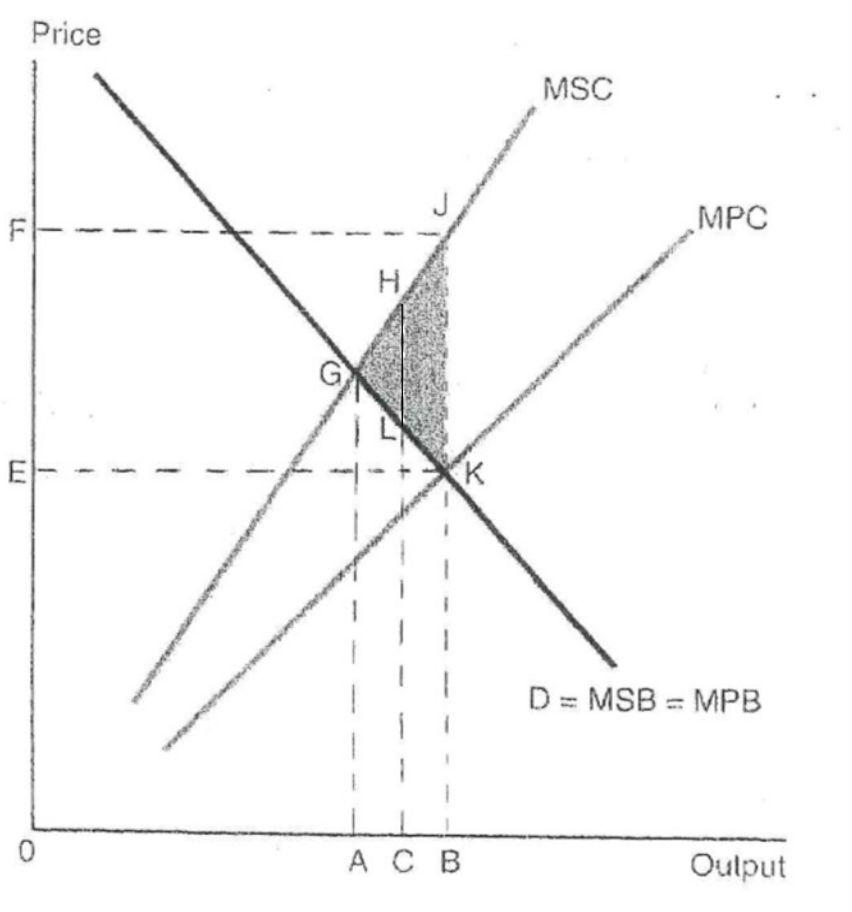
8) By how much will the before tax revenue of producers change?

Advantages and Disadvantages of using Indirect Tax

Arguments in favour of using indirect tax	Arguments against using indirect tax

ACTIVITY – Using indirect tax to reduce the welfare loss of negative externalities:

The diagram below illustrates negative externalities associated with the **production** of a particular good/service (e.g. concrete):



With reference to the diagram above, answer the following questions:

1. What is the free market equilibrium point?

2. What is the socially efficient equilibrium point?

3. Identify the triangle of welfare loss at the free market output level.

4. Draw an additional line 'MPC plus tax' and show how the size of the welfare loss could be reduced to GHL.

5. How could the welfare loss be eliminated *completely* by the tax and why might this be difficult?

Examples of taxes to reduce negative externalities

a. Sugar Tax

Brighton has introduced a 10p payment on all sugary drinks. Jamie Oliver is currently campaigning for a sugar tax. Jamie suggests £1bn could be raised from a sugar tax. A poll carried out by Com Res on 2,000 people estimates that 53% are in favour of a sugar levy.

In 2014 Mexico introduced a 10% sugar tax. The average Mexican drinks 163L of fizzy drinks per year; 30% of the population is obese. Average consumption fell by 12% in 2015 with the greatest improvement amongst low income groups. What do you think were some of the outcomes of the Mexican sugar tax?

Watch the Paxman and Guardian videos and read article from **Economics online**

Identify the 3 most important reasons for and against a sugar tax in the UK

Advantage of sugar tax	**Disadvantage of sugar tax**
(1)	
(2)	
(3)	

a) Do you think the government should introduce a sugar tax?

- Which is your strongest argument for and against?
- What does the success of a sugar tax depend upon?
- What other measure/s could the government introduce?

b) What do we call it when the producers and consumers of a good pay for the external costs?

To summarise

- An indirect tax is a tax imposed by the government that increases the supply costs faced by producers
- The amount of the tax is always shown by the vertical distance between the two supply curves
- Because of the tax, less can be supplied at each price level
- The result is an increase in the market price and a contraction in demand to a new equilibrium output
- A specific tax is a set tax per unit e.g. a £5 tax per unit sold
- An *ad valorem* tax is a percentage tax e.g. 20% on the unit price

Evaluation Points

1

2

3

4

b. Fuel duty

Petrol duty was first introduced in 1909, at a rate of 3d per gallon under the Finance Act 1908. By 1915, this had doubled to 6d, albeit with a 50 per cent rebate for commercial vehicles. However, it was abolished under the Finance Act 1919, which also introduced the tax disc and the taxation of vehicles according to their horsepower rating (the "Treasury Rating").

The current state of affairs with regard to road fuel duties has its origins in Norman Lamont's Budget of 1993. In this, the then Chancellor increased duties by 10 per cent and announced the "fuel duty escalator", under which they would increase annually by 3 per cent above inflation. In November that year, the new Chancellor Kenneth Clarke announced that the escalator would be 5 per cent above inflation per year. This situation persisted until July 1997, when the new Labour Chancellor Gordon Brown increased the escalator rate to 6 per cent above inflation. By 2000, the average price of petrol was 82p per litre.

Public discontent at the price of fuel had been growing for months, particularly amongst farmers and road hauliers. Following protests in France, in September, discontent broke out into a series of go-slow protests through towns and on major roads, and blockades of oil refineries. Since then fuel duty has increased in line with inflation in most years and further planned increases have mostly been dropped.

It currently stands at 57.9p a litre.

A diesel scrappage scheme has been proposed, where the government would provide a subsidy for those willing to scrap their old diesel cars in exchange for buying a newer, less polluting car. This is yet to be introduced. In London there will be a new £10 vehicle charge for the most polluting vehicles in addition to the congestion charge from October 2017.

Arguments for and against fuel tax: complete the table

Arguments for	Arguments against

c. Air Passenger Duty (APD)

Air Passenger Duty was introduced in 1994 as a means of raising revenue without damaging the economy, and was designed to go some way to making up for the anomaly that aviation is otherwise tax-free, paying neither VAT nor fuel duty. Airlines continually argue against the tax claiming that it is economically damaging.
Some argue that the amount of tax should be per plane (rather than per passenger) with vary with the environmental performance of the plane.
APD does nothing to reduce noise pollution caused by planes and despite the tax air pollution persistently breaks the legal limits around Heathrow.

2.2 APD rates from 1 April 2017

Destination Bands and distance from London (miles)	Reduced rate: (for travel in the lowest class of travel available on the aircraft)	Standard rate: (for travel in any other class of travel)	Higher rate: (for travel in aircraft of 20 tonnes or more equipped to carry fewer than 19 passengers)
Band A (0 to 2,000 miles)	£13	£26	£78
Band B (over 2,000 miles)	£75	£150	£450

'A one-size-fits-all tax' (BBC news 5.1.2016)

That's how air passenger duty (APD) was widely regarded when it was introduced 20 years ago. Inevitably, it's increased steadily since then and to this day it has the look of a very blunt instrument.

It adds a flat tax of £13 per head on short haul flights up to 2,000 miles. But for long-haul journeys, including transatlantic flights, it rises sharply to £71 each. Over the past year, George Osborne has eased the burden on families by exempting children under 12 travelling in economy from last May and those under 16, from this coming March.

Even after the chancellor's relaxations in APD, it is still worth more than £3bn a year to the Exchequer. Mr Osborne's tax-cutting rhetoric can only go so far while he remains determined to "repair the nation's finances". And then there is the wide array of 'green' arguments against aviation: why should there be any further special favours, given the environmental costs of an industry which is taxed relatively leniently on the vast but finite energy resources it consumes?

Arguments in favour of APD	Arguments against APD

Data Response question

Figure 2: Air Passenger Duty (APD) rate from April 2012

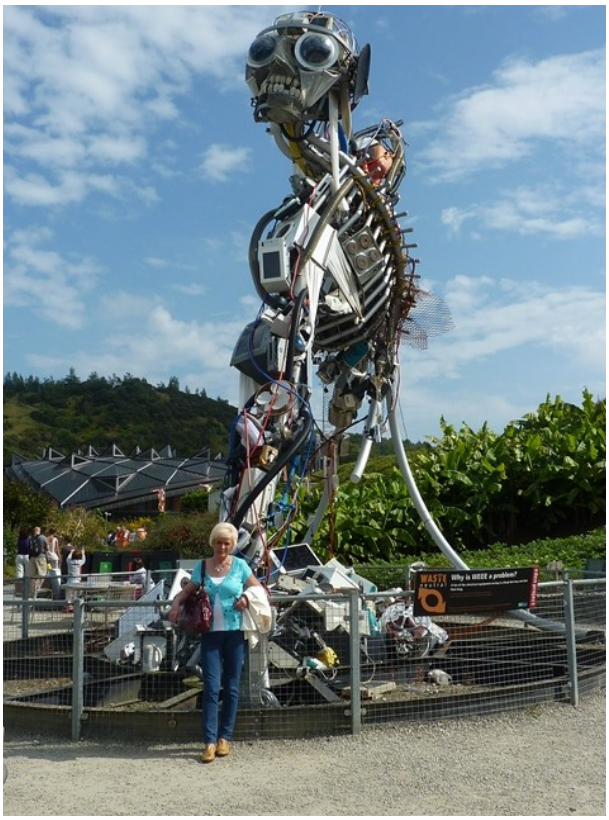
Flight distance (miles)	Economy class (tax per passenger)	Other travel classes, e.g. business class (tax per passenger)
0–2000	£13	£26
2001–4000	£65	£130
4001–6000	£81	£162
Over 6000	£92	£184

The APD is an indirect tax introduced in 2006 and is charged to airlines carrying passengers from UK airports. Between 2010 and 2011 APD remained the same. In April 2012 the government increased APD by 8%.

(Source: © Crown copyright)

Discuss the likely economic effects on air travel of the increase in Air Passenger Duty (APD). Use an appropriate demand and supply diagram in your answer. (15)

3. Regulations



Regulations are generally easy to put in place and quick to take effect. They are used by most countries.

However…….

- Regulations may be costly to administer e.g. paying inspectors
- Firms will have 'compliance costs' e.g. need to pay employees to ensure regulations are met; need to pay for filtering equipment/safer materials
- Fines may need to be set very high to act as a deterrent to large, cash-rich companies

a. Regulations on electrical and electronic waste

The EU is the origin of much of the UK's environmental legislation. Under the WEEE directive manufacturers and retailers have a responsibility to recover and recycle waste electrical products. This directive was followed by legislation to ban the use of certain heavy metals such as lead, mercury, cadmium in electronic products and substitute them with safer alternatives. (The image above shows the 'WEEE man' at the Eden project, a sculpture representing the amount of waste of one individual in a lifetime)

b. Regulations on use of pesticides

Europe poised for total ban on bee-harming pesticides (Guardian, March 2017)

The world's most widely used insecticides would be banned from all fields across Europe under draft regulations from the European commission, seen by the Guardian.

The documents are the first indication that the powerful commission wants a complete ban and cite "high acute risks to bees". A ban could be in place this year if the proposals are approved by a majority of EU member states.

Bees and other pollinators are vital for many food crops but have been declining for decades due to habitat loss, disease and pesticide use. The insecticides, called neonicotinoids, have been in use for over 20 years and have been linked to serious harm in bees.

A fierce battle has been fought between environmental campaigners and farming and pesticides groups. The latter argue the insecticides are vital for crop protection and that opposition is to them is political.

Arguments for pesticide ban	Arguments against pesticide ban

c. Ban on petrol and diesel cars

France to ban sales of petrol and diesel cars by 2040 (Guardian 7.7.17)

France will end sales of petrol and diesel vehicles by 2040 as part of an ambitious plan to meet its targets under the Paris climate accord, Emmanuel Macron's government has announced. The announcement comes a day after Volvo said it would only make fully electric or hybrid cars from 2019 onwards, a decision hailed as the beginning of the end for the internal combustion engine's dominance of motor transport…the decision was a question of public health policy and "a way to fight against air pollution".

Prof David Bailey, an automotive industry expert at Aston University, said: "The timescale involved here is sufficiently long term to be taken seriously. If enacted it would send a very clear signal to manufacturers and consumers of the direction of travel and may accelerate a transition to electric cars."

Norway, which has the highest penetration of electric cars in the world, has set a target of only allowing sales of 100% electric or plug-in hybrid cars by 2025. Other countries have floated the idea of banning cars powered by an internal combustion engine to meet air quality and climate change goals, but have not yet passed concrete targets. The Netherlands has mooted a 2025 ban for diesel and petrol cars, and some federal states in Germany are keen on a 2030 phase-out. India, where scores of cities are blighted by

dangerous air pollution, is mulling the idea of no longer selling petrol or diesel cars by 2030, and said it wants to introduce electric cars in “a very big way”. The UK has an aspiration of all new cars being electric or ultra low emission by 2040, but has been criticised by campaigners and politicans for being slow to act on air pollution.

Why are countries considering using a ban on petrol and car sales at a future date?

Arguments in favour of regulations	**Arguments against regulations**

TRADEABLE POLLUTION PERMITS

Definition: a limit placed on firms' carbon emissions through issue of permits. Permits can be purchased and sold, and fines are imposed if firms exceed limits without buying permits.

They are an attempt to solve the problem of pollution by creating a market for it by using the price mechanism to internalise external costs.

How do they work?

- The government decides an efficient amount of pollution
- Corresponding number of permits released to firms
- These can be traded amongst firms so that low polluters can sell to high polluters and make a profit.
- If the total amount of permits is reduced each year by the government, cuts in total pollution can be achieved.
- This is an example of using **market-based** incentives to achieve pollution reduction.

Carbon Emissions Trading: European Union Emissions Trading Scheme (ETS)

- This unites the countries of the EU in an attempt to cut emissions of the gases fuelling climate change.
- Since the beginning of 2005, about 12,000 energy-intensive plants in the EU have been able to buy and sell permits that allow them to emit carbon dioxide (CO_2) into the atmosphere.
- Companies that exceed their individual limit are able to buy unused permits from firms that have taken steps to cut their emissions.
- Those who exceed their limit and are unable to buy spare permits are fined for every excess tonne of CO_2.
- Industries included in the Emissions Trading Scheme include power generation, iron & steel, glass and cement. Overall, the ETS covers about 40% of the EU's total CO_2 emissions.
- National governments can keep 10% of carbon permits and sell them to raise funds.
- The ETS gives an incentive to firms to invest in clean technology and so reduce carbon emissions in the long term.

The ETS also allows firms to invest in schemes that reduce carbon dioxide emissions outside the EU for example in India and China. The savings in carbon dioxide can then be offset against their own emissions in the EU.

Tata Steel windfall from carbon emissions permits (BBC 8.4.16)

Tata Steel is refusing to comment on claims it has made £700m windfall profits from a policy designed to protect the climate. Three separate experts say Tata made the cash by selling carbon emissions permits it was given for free. They say Tata was allocated more carbon allowances under the EU emissions trading scheme (EUETS) than it needed.

There is no suggestion Tata broke the rules, and the firm said its permits were a "matter of public record". Reports say Tata profited more than any other firm in the UK from the much-criticised trading scheme, which allowed it to sell the surplus to other firms wanting permits to pollute. But the analysis is controversial because some climate sceptics blamed EU climate policies for the demise of Tata.

One report - by consultants CE Delft for citizens' group Carbon Market Watch - shows that the ailing steel firm was the UK's biggest beneficiary of the EUETS windfall, making £704m. Overall it says industry across Europe has earned a £19bn windfall from 2008 to 2014. Tata declined to comment on the specific figures, but said it disagreed with the methodology used in the reports for calculating its profits from the EUETS. It said the allegations were a "selective telling of the many flaws in the EUETS."

A spokesman told BBC News: "We agree that the current emissions trading system needs to be fixed and all parties should focus on how best this can be done, rather than conducting theoretical studies on what it could have previously meant for individual companies."

The problem happened because when the EUETS began national governments were left to decide how many carbon permits their industries needed to cushion themselves from foreign competition. The governments typically allocated more permits than necessary because it cost them nothing directly, whilst boosting domestic firms. The sectors profiting most from pollution payouts have been iron and steel, cement, refineries and petrochemicals. One report says the amount netted by industry over the period is more than 10 times the amount the EU has spent on innovation under the EUETS to make firms more energy efficient.

I understand Tata is telling critics privately that it cannot be blamed for legitimately exploiting loopholes in a badly designed system. Green groups say this is disingenuous as major European polluters lobbied governments to give them more emissions permits than they would really need. (Smaller firms not facing competitive global pressure had to buy all their emissions permits).

The EUETS has long been criticized for its failure to reduce carbon emissions, and citizens' groups are pressing for it to be reformed again. Femke de Jong, of Carbon Market Watch, said: "Instead of making the polluter pay, energy-intensive companies are allowed to pollute for free under the EUETS. Even worse, they are able to profit from their pollution to the tune of billions. It's European taxpayers that are picking up this bill as governments forego scarce public money.

Emil Dimantchev, carbon analyst from Thomson Reuters, estimates that Tata Steel is likely to have netted around £794m (€1bn) between 2008 and 2014 in windfall profits.

Tata Steel said: "It is a matter of public record that on occasions we have been allocated more permits than we used. There are a number of reasons why in some years we haven't used all of our permits, which includes increasingly efficient production techniques and the impact of the global economic and steel industry crisis. The latter means that our volumes of production, and therefore emissions, have been well below what anyone forecast and in the main

they continue to be so. However, it is important to note that the situation changes on an annual basis, so in 2014 Port Talbot was under-allocated and this meant that we had to spend scarce resources on additional permits."

Questions:

1. How has Tata made the £700m windfall profits?

2. Why have governments allocated more permits than necessary?

3. Which sectors have profited most from the pollution payouts? Why do you think this is?

4. What has happened to the concept that the 'polluter pays'?

5. What percentage of the overall European windfall figure of £19bn has Tata achieved?

6. What reasons does Tata give for not having used all of their permits?

Advantages of permit schemes	Disadvantages of permit schemes

Data Response Question

Extract 1 Carbon emissions trading scheme in Australia

Around 500 of Australia's biggest polluting companies will be forced into an emissions trading scheme in 2015, similar to that operating in the European Union. The Australian Government intends to achieve a 5% cut in carbon emissions by 2020. Although Australia accounts for just 1.5% of global greenhouse gas emissions, its heavy reliance on coal fired power stations makes it one of the world's biggest carbon polluters per head of population. It is also the world's biggest exporter of coal.

Initially, the companies in the scheme will receive 94.5% of their carbon permits for free, and then obtain government subsidies to purchase the other 5.5% of permits, so that no additional costs to the firms arise. Gradually over time, these subsidies will be removed. Emissions trading schemes have also attracted interest from China and South Korea.

However, the scheme is a blow to the Australian mining industry which faces carbon costs of at least 25 billion Australian dollars by 2020. According to Anglo American Corporation, some 40 000 jobs are directly at risk and a further 100 000 indirectly. It also believes some mining investment projects will be cancelled, adding further to structural unemployment. Government training programmes and relocation subsidies may be required to improve the mobility of labour.

(Source: adapted from © *The Financial Times*, 10th July 2011 and 8th November 2011)

With reference to Extract 1 and your own knowledge, assess the benefits of a system of tradable pollution permits for reducing carbon emissions. (15)

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1.4.1 Government intervention in markets *(to exploit POSITIVE externalities)*

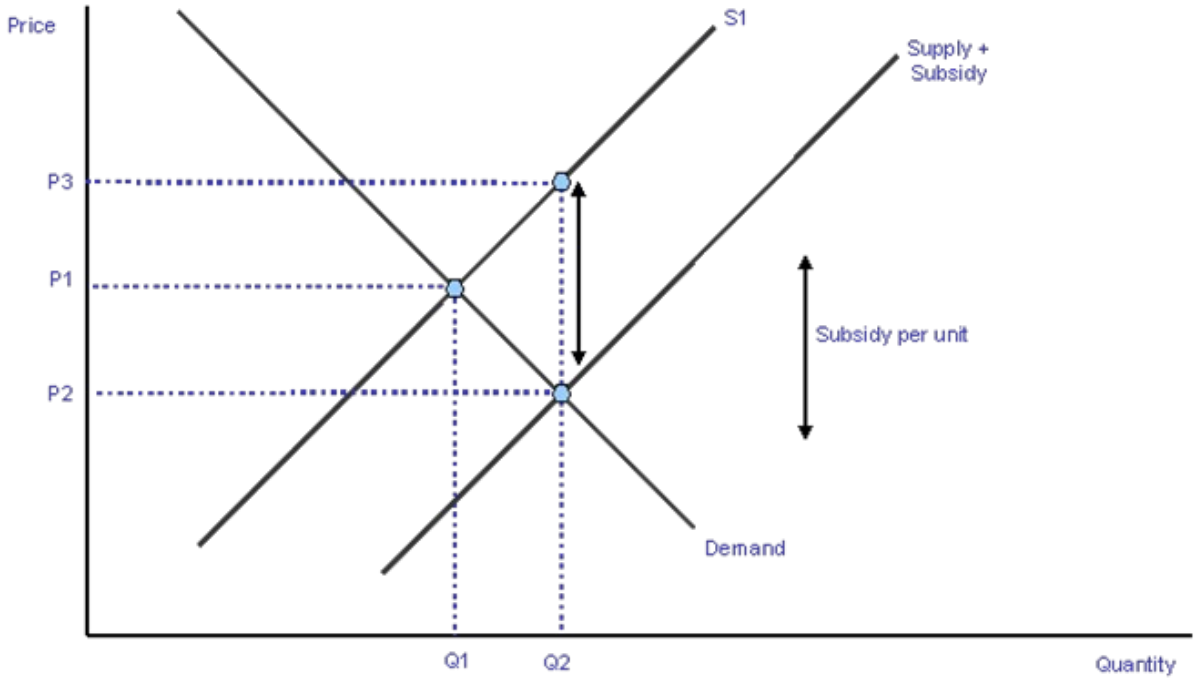
(a) (ii) subsidies
(b) (iii) provision of information
(iv) regulation

SUBSIDIES

A subsidy is an amount of money given directly to firms by the government to encourage production and consumption. A unit subsidy is a specific sum per unit produced which is given to the producer.

The effect of a specific per unit subsidy is to shift the supply curve vertically downwards by the amount of the subsidy. In this case the new supply curve will be parallel to the original. Depending on elasticity of demand, the effect is to reduce price and increase output.

A government subsidy encourages an increase in supply at each price level because the subsidy provides a reduction in a firm's costs of production. The extent of the subsidy per unit is shown by the vertical distance between the two supply curves.

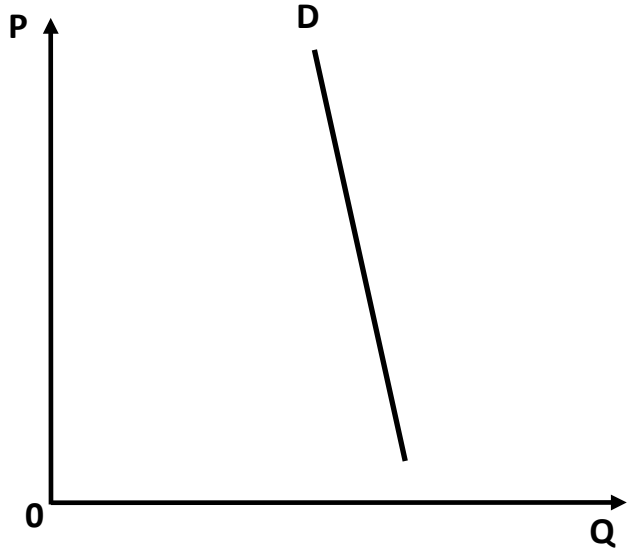


a) What is the change in price?
b) What is the change in output?
c) Shade in the area representing the total cost of the subsidy

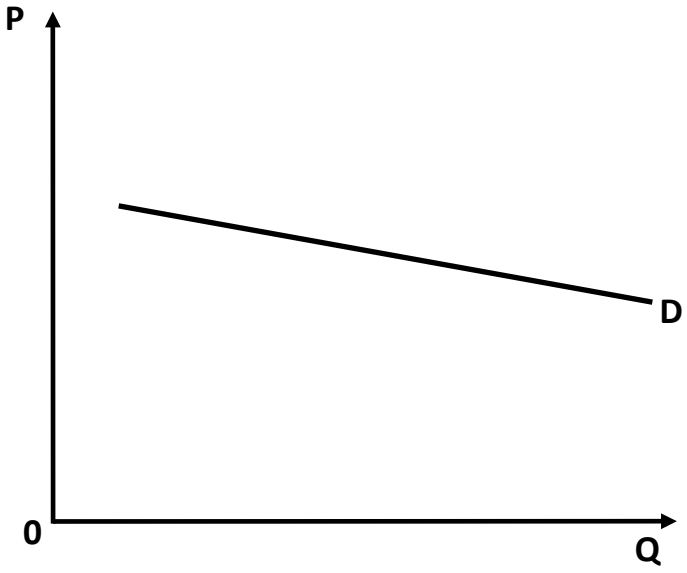
Subsidies and elasticity (PED)

The extent to which the benefit of a subsidy is felt by consumers rather than producers depends on price elasticity of both **demand** (below) and supply (p45):

PED inelastic



PED elastic



1. Draw a supply curve (roughly 45 degrees) on each diagram and then draw on a subsidy.

2. Identify the total subsidy paid.

3. Identify the subsidy received by the producer.

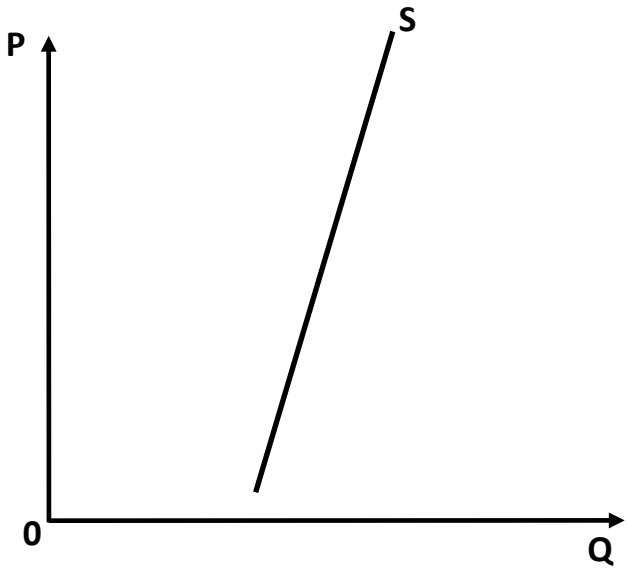
4. Identify the subsidy received by the consumer.

5. What difference do you observe?

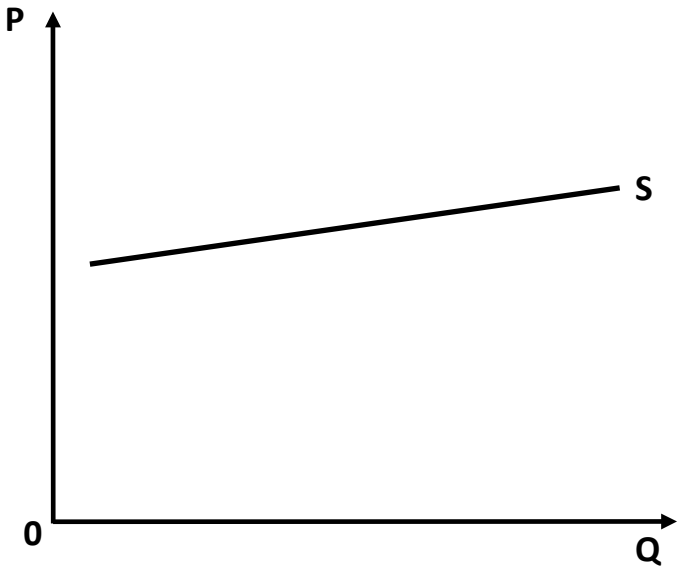
Subsidies and elasticity (PE<u>S</u>)

The extent to which the benefit of a subsidy is felt by consumers rather than producers *also* depends on price elasticity of **supply** (below):

PES inelastic



PES elastic



1. Draw a demand curve (roughly 45 degrees) on each diagram and then draw on a subsidy.

2. Identify the total subsidy paid.

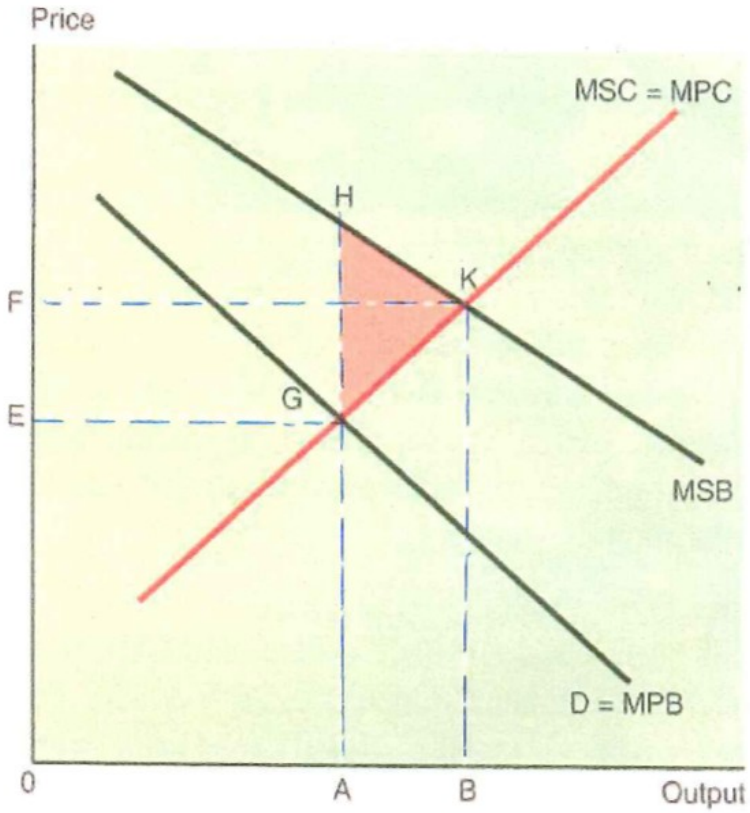
3. Identify the subsidy received by the producer.

4. Identify the subsidy received by the consumer.

5. What difference do you observe?

ACTIVITY – Using subsidies to exploit the potential welfare gain of positive externalities:

The diagram below illustrates positive externalities associated with the **consumption** of a particular good/service (e.g. education):



With reference to the diagram above, answer the following questions:

1. What is the free market equilibrium point?

2. What is the socially efficient equilibrium point?

3. Identify the triangle of welfare loss/potential welfare gain at the free market output level.

4. Draw an additional line 'MPC plus subsidy' and show how the size of the welfare loss could be reduced/potential welfare gain captured.

5. How could the welfare loss/potential welfare gain be eliminated/captured *completely* by the subsidy and why might this be difficult?

Economic Arguments against Subsidies

- Argument for a subsidy should be judged carefully on the grounds of economic efficiency and also fairness (or equity). We need to be careful to measure and evaluate who gains from any particular subsidy and who pays. Might the money used up in subsidy payments be better spent elsewhere? Government subsidies inevitably carry an **opportunity cost** and in the long run there might be better ways of providing financial support to producers and employees in specific industries.
- Free market economists argue that government subsidies distort the workings of the free market mechanism and can eventually lead to government failure where government intervention actually leads to a worse distribution of resources.
- Export subsidies distort the free trade in goods and services and can severely curtail the ability of LEDCs to compete in the markets of industrialised countries
- Arbitrary Assistance: Decisions about which groups or industries receive a subsidy can be arbitrary – if tourism is supported, why not the British steel industry?
- Financial Cost: Subsidies can become expensive and must be financed from tax revenues
- Who pays and who benefits? The final cost of a subsidy usually falls on consumers (taxpayers) who themselves may have derived no benefit from the subsidy
- Encouraging inefficiency: Subsidy can artificially protect inefficient firms who need to restructure – i.e. it delays much needed economic reforms
- Risk of fraud: Ever-present risk of fraud when allocating subsidy payments – this is a problem that has been identified in the EU with agricultural subsidies
- There are alternatives: It may be possible to achieve the objectives of subsidies by alternative means which have less distorting effects, for example by direct income support through the tax and benefit system (for example for framers)

Data Response question: Bus services

Extract 1

Supported buses are services that are subsidised by local authorities because they are not provided by commercial bus companies. They serve communities where no alternative route exists, meaning that any cut or alteration can often have a huge impact on residents and local economies. They also provide services in evenings and at weekends when otherwise services would cease. These subsidised or supported services represent 22 per cent of bus provision in England.

A report by the Institute of Transport Studies at the University of Leeds has found that the UK labour market is reliant on buses, with more people commuting to work by bus than all other modes of public transport combined. Two out of five job seekers say lack of transport is a barrier to getting a job, whilst the increasing cost of bus fares can also be extremely problematic.

Buses are the lifeblood of the UK economy. There isn't a single area of our daily lives that doesn't in some way depend on bus services. We need buses for a thriving job market. More people commute by bus than all other public transport combined, and those commuters create goods and services with a value of £64 billion. Buses are also crucial to the vitality of our towns and city centres, with more people accessing our high streets by bus than by any other mode. Bus users make 1.4 billion shopping trips every year with an estimated retail spend of £27 billion.

Young people are more reliant than any other group on bus services. For 80 per cent of young unemployed people, buses are their only means of access. We must support buses if we are serious about helping our young people access work and training opportunities. And buses are key to sustainable economic growth. Buses reduce congestion and carbon emissions and offer an immediate and low cost solution to the serious environmental challenges we face."

Bettertransport.org.uk

Figure 2: The cost of travel by motor vehicle, rail and bus

Index 1996 = 100	**1996**	**2001**	**2006**
Motoring (cars)	100	114.8	119.0
Bus fares	100	120.2	146.6
Rail fares	100	116.6	136.3
Retail Price Index	**100**	**111.5**	**129.7**

Figure 3: Household income and bus travel

	1996	**2001**	**2006**
Average gross weekly household income (£ current prices)	£397	£541	£615
Bus travel (billion vehicle km travelled)	5.0	5.2	5.4

(Source of Figures 1–3: Annual Abstract of Statistics 2008.)

Question: Evaluate the likely benefits of an increased subsidy for bus and rail travel. Use an appropriate diagram to support your answer (15)

Data Response question: Arts subsidies

Extract 1: Adam Smith Institute

In many countries the arts have been effectively nationalized. In the United Kingdom, for example, not one of the national opera, ballet or theatre companies turns a profit: they survive on taxpayer subsidies. Regional companies are even more dependent on handouts. On the continent of Europe, opera and ballet is even more reliant on state subsidy.

The arts have suffered from being welfare-dependent. Between 1950 and 1994 public expenditure on the arts in Britain increased twentyfold in real terms. In contrast, public expenditure as a whole merely (!) trebled. By 1996, each seat in the Royal Opera House, Covent Garden was being subsidized to the tune of £28. As Dominic Hobson points out in the National Wealth: 'All too often the quality of subsidized art is low, the cost of producing it is high, and the prices charged to consumers are excessive.'

State support tends to lead to the bureaucratization of the arts and an obsession with form-filling and performance indicators that stifles artistic vision. State subsidies allow producers to raise their costs which, perversely, means that ticket prices are driven up too.

Instead, policy makers should encourage sponsorship of the arts by businesses, individuals and charities through tax incentives. In the United States there is virtually no government funding of the arts. Helped by tax allowances, private sponsorship fulfils this role. Even television is supported in this way: PBS (the 'Public Broadcasting Service') works as a private, non-profit media enterprise, owned and operated by the nation's 349 public television stations. It provides children's, cultural, news, nature, education, history, science, and public-affairs programming to 100m people each week. Its billion-dollar budget comes largely from the subscriptions of private members and from business and foundation support.

The UK's Glyndebourne Opera has shown that it possible to attract audiences without the need for state subsidy. Taking advantage of the economic recession of the early 1990s, it entirely rebuilt the opera house for £33.5 million. Production costs are half those of the state funded Royal Opera House.

Extract 2: Erica Whyman, artistic director of Northern Stage

It has become stylish to imply that "receiving public funding" really means "stealing from innocent taxpayers in order to pay for the indulgences of the unworthy".

I am convinced that the arts are a significant public good, that civic well-being is damaged when the arts are unsupported and, while they make an important economic contribution, their profitability is not a sufficient measure of their quality or their success. I am increasingly uncomfortable with the economic argument, because it suggests that only activities which generate economic growth are deserving of public investment. Caring for the elderly, for instance, would fail this test.

However, it is worth repeating that public money spent on the arts has a proven tendency to turn into money spent elsewhere: on hotel rooms, restaurants, production supplies and, most importantly, jobs. In Newcastle and Gateshead, every £1 of public investment in the 10 main cultural buildings results in £5

generated by the regional economy, according to the Treasury's own calculations, not least because between us we employ over 2000 people. Many of those jobs will be swiftly at risk if proposed cuts go ahead.

Extract 3 **Arts and culture: making life better?** (Arts Council England, 2015)

As news reports focus on seemingly endless problems, it is easy to overlook the brighter side of life. Arts Council England (ACE) is an organisation that 'champions, develops and invests in artistic and cultural experiences that enrich people's lives'. 'In short,' it says, 'it makes life better.'

Between 2011 and 2015, ACE allocated £1.4 billion of taxpayers' money, and an estimated £1 billion from the National Lottery, to a range of activities and events, such as those provided by museums, theatres, and music festivals. It can be argued that the social benefits of these activities outweigh the private benefits and, in addition, it is stated that for every £1 invested in arts and culture, up to £6 is generated elsewhere in the economy.

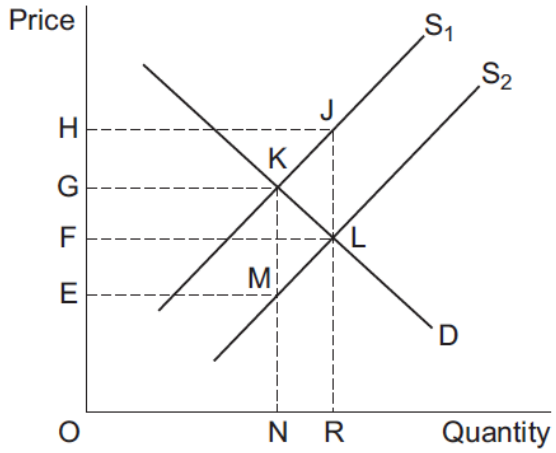
Education also has a role to play in enriching people's lives. Schools provide countless opportunities for children and young adults to experience a variety of cultural and sporting activities. In some towns, local councils have provided licences to enable small businesses, such as bars and cafes, to host 'live' entertainment events, with other firms providing sponsorship for the shows. This allows for a more market−based approach. The performers enjoy performing, the firms generate income from the spectating public and the public have a great time. Everybody wins!

Question: Using the data and your knowledge of economics, evaluate the view that providing subsidies is the best way to ensure that sufficient resources are devoted to the arts and cultural activities. (15)

Short answer questions

1.

In the diagram below, the government grants a subsidy to manufacturers of loft insulation. This shifts the market supply curve from S_1 to S_2.



The total amount spent by the government on subsidies is represented by the area

A OHJR.

B FHJL.

C OFLR.

D EGKM.

2.

Which one of the following statements about subsidies is most likely to be correct?

A subsidy

A increases the price elasticity of demand of a good.

B leads to an increase in the output sold of a good.

C shifts the supply curve for a good to the left.

D leads to a rise in the equilibrium price of a good.

REGULATION

Education legislation in England

You can leave school on the last Friday in June if you'll be 16 by the end of the summer holidays.

You must then do one of the following until you're 18:

- stay in full-time education, for example at a college
- start an apprenticeship or traineeship
- spend 20 hours or more a week working or volunteering, while in part-time education or training

1.3.3 Public goods

a) **Distinction between public & private goods using the concepts of non-rivalry & non-excludability**
b) **Why public goods may not be provided by the private sector: the free rider problem**

Most of the goods and services we buy are private goods. We are willing to pay for them as they provide utility and we would not have access to them unless we paid for them. Markets provide these goods in the private sector.

However, markets may be 'missing' for public goods which have the following THREE characteristics:

(1) Non-excludability

When a public good is supplied, it is impossible to exclude other individuals from deriving a benefit. For example a fireworks display and street lights.

(2) Non-rivalry

When a pure public good, such as traffic lights, is consumed by one individual, the stock available for others does not diminish, as it would in the case of a private good so consumers do not need to compete with each other to get access to them.

(3) Non-rejectability

A public good cannot be rejected, individuals are forced to consume it. For example, it is not possible for individuals to reject consumption of UK defence goods such as nuclear deterrent.

The 'free rider' problem

Because public goods are non-excludable it is difficult to charge people for benefitting once a product is available. The free rider problem leads to under-provision of a good and thus causes market failure. Free riders have no incentive to reveal how much they are willing and able to pay for a public good because they can enjoy benefit without paying. Private sector firms will not be willing to provide such goods if they are unable to sell them and make a profit from doing so. There would be no demand curve if individuals are unwilling to pay for a good. Likewise, firms would not have the incentive to provide them, hence no supply curve.

Pure public goods and quasi-public goods

Goods/services which have all of the above characteristics are called **pure** public goods. Examples would be street lighting and lighthouses.

Some goods or services have some but not all of the characteristics of public goods. These are called semi or **quasi**-public goods.

Explain why this might be the case for:

- Roads/motorways

- Beach

- Wi-Fi- networks

- Policing

Short answer questions

1.

A pure public good is always

Public goods result in market failure because

A in the absence of government intervention, a working market for the product is unlikely to become established.

B pure public goods are both rival and excludable.

C the positive externalities in consumption exceed the private benefits.

D the marginal social cost of providing public goods exceeds the marginal social benefit.

nal person.

2.

1.4.1 Government intervention in markets
(b)(ii) Public good policies

Government Provision

If public goods are not provided in a free market economy, the government can increase welfare by providing them free of charge (financed by general taxation). Society would be worse off if there was no police force and no streetlights. In theory the government should provide the optimum or allocatively efficient level of services.

- The non-rival nature of consumption provides a strong case for the government rather than the market to provide and pay for public goods.
- Many public goods are provided more or less free at the point of use and then paid for out of general taxation or another general form of charge such as a licence fee.
- State provision may help to prevent the under-provision and under-consumption of public goods so that social welfare is improved.
- If the government provides public goods they may be able to do so more efficiently because of economies of scale.

A common mistake made by students is to argue that all services provided by the government are public goods. The word 'public' in the term 'public goods' refers to the fact that the public cannot be excluded from consuming that good. On the other hand, health and education are examples of **merit goods** (<u>not</u> on Edexcel Economics (A) A level specification) that may be provided by the governmentwhich have positive externalities so are likely to be underprovided by the free market, and could not be afforded by all.

Explain why health care and education are **not** examples of public goods:

Problems with government provision:

- If the government has imperfect knowledge it may overprovide or underprovide public goods
- The government might have political motives which affect the provision of public goods for example there will be a significant opportunity cost; different governments will have different views on defence provision
- The government is a monopoly provider so may be inefficient
- If public goods are provided free of charge, e.g. roads, there may be overuse when they are treated as 'free goods', e.g. roads.

Alternatives to government provision

Lighthouses are a good example of a pure public good. However, most are not provided by the government but by Trinity House

which was set up in 1514. It was incorporated by Royal Charter by Henry VIII. Trinity House has been building lighthouses since then. It is a charity, with funding provided by 'Light Dues' which are paid by ships entering UK ports, the amount depending on their tonnage.

Trinity House maintains over 60 lighthouses around England, Wales, the Channel Islands and Gibraltar such as Eddystone, Bishop Rock or Longstone lighthouses.

Essay question: **Evaluate the case for government provision of goods and services such as flood defence schemes or housing. (25)**

Plan

Other types of government intervention

1.4.1(a)(iii) maximum and minimum prices

Maximum price – the highest price a good is allowed to be sold for/ a ceiling price.
Minimum price – the lowest price a good is allowed to be sold for / a floor price.

MAXIMUM price

A maximum price is set **below** equilibrium. There is an extension of demand and a contraction of supply.

Mark in the new QD and QS and the shortage created.

Case study 1: Maximum price of milk- Cyprus (2013)

A government-enforced price cap on fresh pasteurized milk will be lifted on Monday, allowing the market to regulate the price of this basic commodity once more.
In a statement on Thursday, the commerce ministry said the price control – enforced by ministerial decree – had prevented hikes along the supply chain, ensuring that consumers had access to affordable milk.
The ministry added, that **price controls** were a temporary measure and as such it decided not to renew the cap.
It went on to urge economic operators to exercise restraint and not to take advantage of the end of the cap to hike up prices at the first opportunity.
The ministry said it would be monitoring the situation once the price control is lifted and, if necessary to protect consumers' interests, would not hesitate to intervene anew.
The price of milk is set at €1.41 per litre for retail and €1.32 per litre for wholesale, including VAT.
The price cap decree was originally issued by the previous commerce minister Neoclis Sylikiotis after farmers threatened to increase the price of raw milk by 1.8 cents after they had already raised the price by four cents.

What was the purpose of this price cap for milk?

What would be the likely unintended consequences of a maximum price for an agricultural product?

Case study 2: Maximum price for away football tickets

The Football Supporters Federation has announced a campaign called the 'Score Campaign', which aims to limit away tickets to a maximum price of £20 and will be launched in Manchester next Thursday. Speaking on behalf of the FSF, deputy chair Martin O'Hara said: "Those who follow their team away are the distilled essence of the football fan - the hardcore. Without away fans the atmosphere at games dies and football loses a large part of what makes it so special.

"Travelling supporters spend the most time and money on their team and that deserves recognition and reward. In the short term clubs might make a few extra quid by squeezing away fans dry but long-term vision is required.

"Away attendances are in decline and something must be done by the clubs before that becomes terminal. Who wants to go to games without away fans, games without passion?

"We believe that an away ticket price cap of £20 would make football more affordable and halt the decline in away fan attendances. The Score Campaign aims to make this a reality."

The FSF say one of their recent surveys revealed that nine out of 10 fans feel ticket prices are currently too high.

Free market view

The Adam Smith Association does not believe in any intervention in markets. It claims that markets should be allowed to settle at their equilibrium level, and this will give us the best, most efficient allocation of resources. The society is not convinced that the minimum wage is a good thing for the economy, and is concerned that some people have recently suggested we need a maximum price limit for houses in the UK.

Explain why the price mechanism provides the best, most efficient allocation of resources

A maximum price for houses

In 2004 the Bank of England expressed concern about the rapid rise in house prices. At that time the average British house cost just over £150,000, 85% more than three and a half years previously. Other retail prices had risen about 20% over the same period. There were two major concerns. The first was that people were borrowing large amounts of money because their houses were worth more, which causes rising levels of debt and consumer spending in the economy. The second was that more and more people were unable to afford to buy a house.

This problem persists. Those on low incomes are unable to buy a house, and young people have to wait much longer than before to buy a property, even graduates on reasonably large starting salaries.

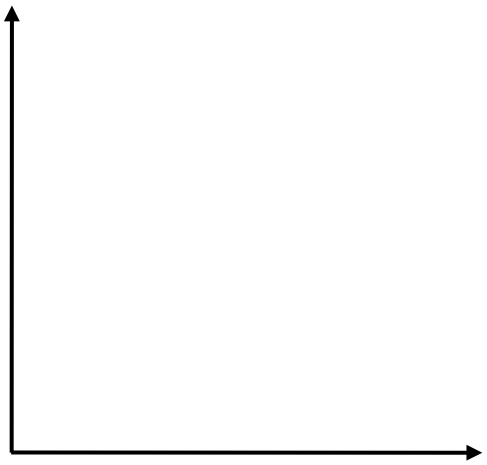
Maximum price legislation is rarely used in peacetime but has been used to regulate rented accommodation in both the UK and USA in the past. If a maximum price was applied to owner occupied housing, the government would need to decide on a maximum price level, above which it would be illegal to sell a house. They would need to decide on the time period for which this would apply, and whether it would apply to all regions of the UK.

Alternatively, the government might decide to 'freeze' house prices at a particular moment in time, which would mean setting the maximum level at the market rate ruling on a particular day. First time buyers would be guaranteed that house prices would not accelerate away from them.

Arguments for and against a maximum price for houses

Arguments for a maximum price	Arguments against a maximum price

MINIMUM price



A minimum price is set **above** equilibrium. The price is unable to fall to equilibrium.

There is a contraction of demand and an extension of supply. Mark in the new QD and QS and the surplus created.

Minimum price for alcohol – arguments for and against

Minimum prices would have most effect on the cheapest, strongest end of the spectrum, substantially upping the price of budget ciders (like the notorious, discontinued White Lightning). Some of these could more than double in price. For this reason, it has gained the support of a wide range of health campaigners: upping the prices of these drinks could target the most problematic drinkers.

Those who support a minimum price say there is strong evidence internationally that price is linked to consumption, and higher consumption is linked to higher harm. They point to Finland where in 2004 a dramatic cut in prices via taxes led within a year to an increase of 9% in consumption, according to official figures.

Most alcohol in Finland is sold through tightly controlled government-run shops. By 2005 alcohol-related problems were the most common cause of death among Finns of working age.

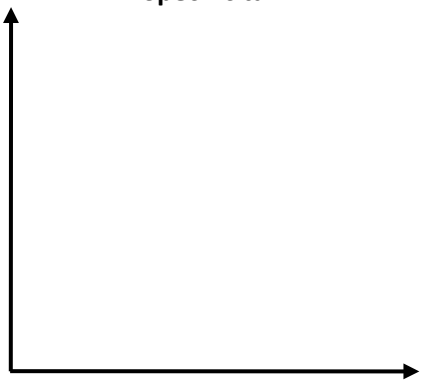
A 2008 model by the University of Sheffield suggested that a high enough minimum price could significantly reduce the impact and cost of alcohol to society. It found that problem drinkers seek out the cheapest ways to get drunk as they tend to be either young or those who drink a lot, and therefore would change their behaviour in response to price increases more than moderate drinkers would. (It has been strongly challenged by the drinks industry).

Tim Harford points out that it would up the profit margins of supermarkets. He recommends increasing taxation further instead, as this would ensure that prices rise in proportion and would put the extra revenue in the hands of government rather than supermarkets. Rather paradoxically, minimum prices could make cheap alcohol a very lucrative product for supermarkets (because of the mark up).

Draw TWO supply and demand diagrams, one showing the effect of a minimum retail price for alcohol and another to show the effect of an increased specific tax on the price of alcohol

Minimum price

Specific tax



Explain the impact on consumer surplus of the higher price.

Give ONE argument in favour of a minimum price and

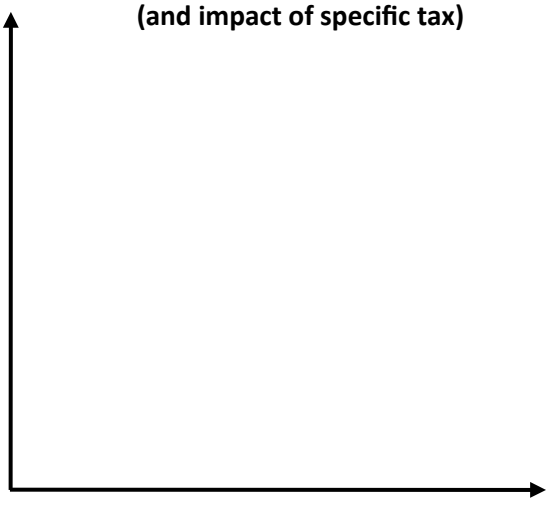
ONE argument in favour of a higher rate of tax.

What is the nature of the market failure that requires

government intervention in this market?

Use a diagram to illustrate the market failure.

Market failure
(and impact of specific tax)



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1.3.4 Information gaps

a) The distinction between symmetric and asymmetric information

b) How imperfect market information may lead to a misallocation of resources

Good decision-making requires good information. When drawing the demand curve for an individual we assume they know how much utility they will gain from the product. This may be a reasonable assumption for non-durables e.g. a bar of chocolate but not for a durable e.g. a washing machine or a second hand car – how long before it breaks down?

Standard text book theory assumes economic agents have perfect information about availability of goods, prices and make rational decisions based on full information about the product.

Information failure is when people have inaccurate, incomplete, uncertain or misunderstood data and so potentially make 'wrong' decisions. Reasons:

- Misunderstanding the true costs and benefits of a product
- Uncertainty about costs and benefits
- Complex information e.g. energy tariffs
- Inaccurate, incomplete or misleading information
- Addiction/habitual consumption

Information failure and negative externalities

- Some goods bring less benefit (or cause more harm) to consumers than they expect. They are overprovided by the price mechanism e.g. cigarettes, hard drugs, high fat foods.
- Information needs to be provided to consumers to help them make more informed decisions. HOWEVER, in some cases this information may be ignored. Information failure meant government messages failed to have desired effect, hence the ban on smoking in public places in 2007.

Examples include the following:

1. **Warranties:** The miss-selling of extended warranties by high street retailers on domestic electrical goods such as televisions and dishwashers
2. **Sub-prime mortgages:** A lender does not know how likely a borrower is to repay their loan.
3. **Insurance:** A car insurance company cannot tell the risks associated with each single driver

Case study: Insurance

Insurance companies may estimate premiums e.g. for health insurance, based on the estimated cost of treatment for the average person e.g. £200 a year.

However, those most likely to require pay outs may not be the 'average' but those more likely to get ill, requiring £400 of treatment.

If a premium of £400 is charged this discriminates against the 'average' person.

Therefore, insurance companies may request more detailed information to set appropriate premiums.

Moral Hazard

Moral Hazard arises because an individual or institution does not bear the full consequences of its actions and therefore, has a tendency to act less carefully than it otherwise would, leaving another party to bear some responsibility for the consequences of those actions.

4. **Market for used cars:** A used-car seller knows more about the quality of the car being sold than do buyers (see p66 article – 'lemons')
5. **Private dentists:** _____

The principal-agent problem

The principal- agent problem occurs when goals of principals – those standing to gain or lose from a decision – are different from agents – those making decisions on behalf of the principal.

Asymmetric information is also associated with the principal-agent problem. In an increasingly complex world, individual decision making often relies on the advice given by experts, and a potential principal-agent problem can occur whenever decision makers rely on advice from others with more knowledge than they have.

For example, the shareholders of firms – the principals – usually delegate responsibility for day-to-day decision making to appointed managers – the agents. This creates a situation of asymmetric knowledge, with managers knowing much more than the shareholders, and raises the possibility of inefficiencies, especially when shareholders and managers have different objectives.

Examples of these inefficiencies include situations when managers decide to 'take the easy life', knowing that shareholders will not find out, and managers deciding to 'cheat' and not reveal information to shareholders. This may occur in situations involving insider dealing, where managers can exploit their knowledge of a business' prospects to buy or sell shares and make a personal gain.

Symmetric information exists where buyers and sellers have access to the same information.

Asymmetric information exists where buyers and sellers have different amounts of information. This is an example of how imperfect market information may lead to a misallocation of resources.

Task: Why might there be imperfect market information in the following markets and what might be the consequences and solutions

	Reason for imperfect market information	Consequences and solutions
Health care e.g. doctor, dentist, hospital, optician		
Education		
Pensions		
Alcohol /Tobacco		
Second hand car market		
Insurance		

Any colour you like, as long as it's lemon (Tim Harford, 2006)

I recently did something that is, in theory, most unwise: I bought a second-hand car. Since economists hate to compromise between safety and style, it was a Volvo. You'd think I would know better. In 1966, an assistant economics professor, George Akerlof, tried to explain why this is so in a working paper called "The Market for Lemons". His basic insight was simple: if somebody who has plenty of experience driving a particular car is keen to sell it to you, why should you be so keen to buy it?

Akerlof showed that insight could have dramatic consequences. Buyers' perfectly sensible fears of being ripped off could, in principle, wipe out the entire used-car market: there would be no price that a rational seller would offer that was low enough to make the sale. The deeper the discount, the more the buyer would be sure that the car was a terrible lemon.

More plausibly, only the market for cheap, shoddy used cars would survive. A person with a good car would hold on to it because he couldn't prove it was good and so wouldn't expect an attractive offer for it. And if the good cars aren't put up for sale, the lemons will be what is left. This is a problem not just for buyers, but for sellers too, who wish they could be trusted.

Akerlof turned economics on its head – and eventually received the Nobel Prize for doing so – not by documenting the travails of used-car buyers and sellers, but by showing how corrosive a little bit of inside information can be to all sorts of markets. Insurance, including health insurance, is one possible casualty. Loans and mortgages too: some people simply cannot get a loan, no matter how much interest they offer to pay.

Then there's the market for jobs. How many of your colleagues are lemons? If you're competent but can't prove it to your boss, you may prefer to be freelance. If other competent workers think that way, it may explain why you think your colleagues are idiots and they think the same about you.

These problems can be solved, but at a cost. Mortgage companies refuse credit to whole neighbourhoods as a way of cutting out high- risk borrowers. Employees spend years acquiring qualifications with little value other than proving that they're smart and work hard. And used-car buyers will look for trusted sellers, even if that raises the cost of doing business. I bought my Volvo from my brother-in-law because I thought that would lower the risk of being sold a lemon.

Not only are the solutions costly, they don't always work. My Volvo lasted less than a fortnight before the clutch burned out: a bitter little lemon after all.

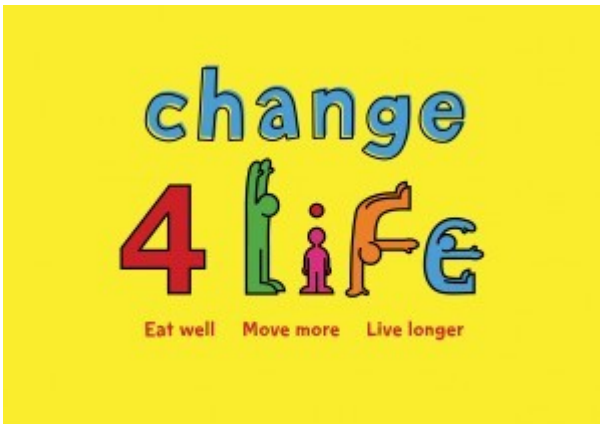
Watch the video clip at https://www.youtube.com/watch?v=cYcsFyim_Cs

Questions

Explain the information failure in the market for second hand cars.

How might individuals reduce the risks of buying a second hand car?

PROVISION OF INFORMATION – examples


change
4 life
Eat well Move more Live longer


Let's knock the spots off
Measles
Protect yourself
with the MMR


BE A FLU
FIGHTER

Short answer questions

1.

In 2010 the UK Government expressed concern that many workers had **not** made adequate pension contributions to fund their retirement. A possible explanation for this under funding of pensions is:

A pensions are a public good.

B there is no opportunity cost to making pension contributions.

C workers have imperfect information.

D tax incentives for making pension contributions have increased.

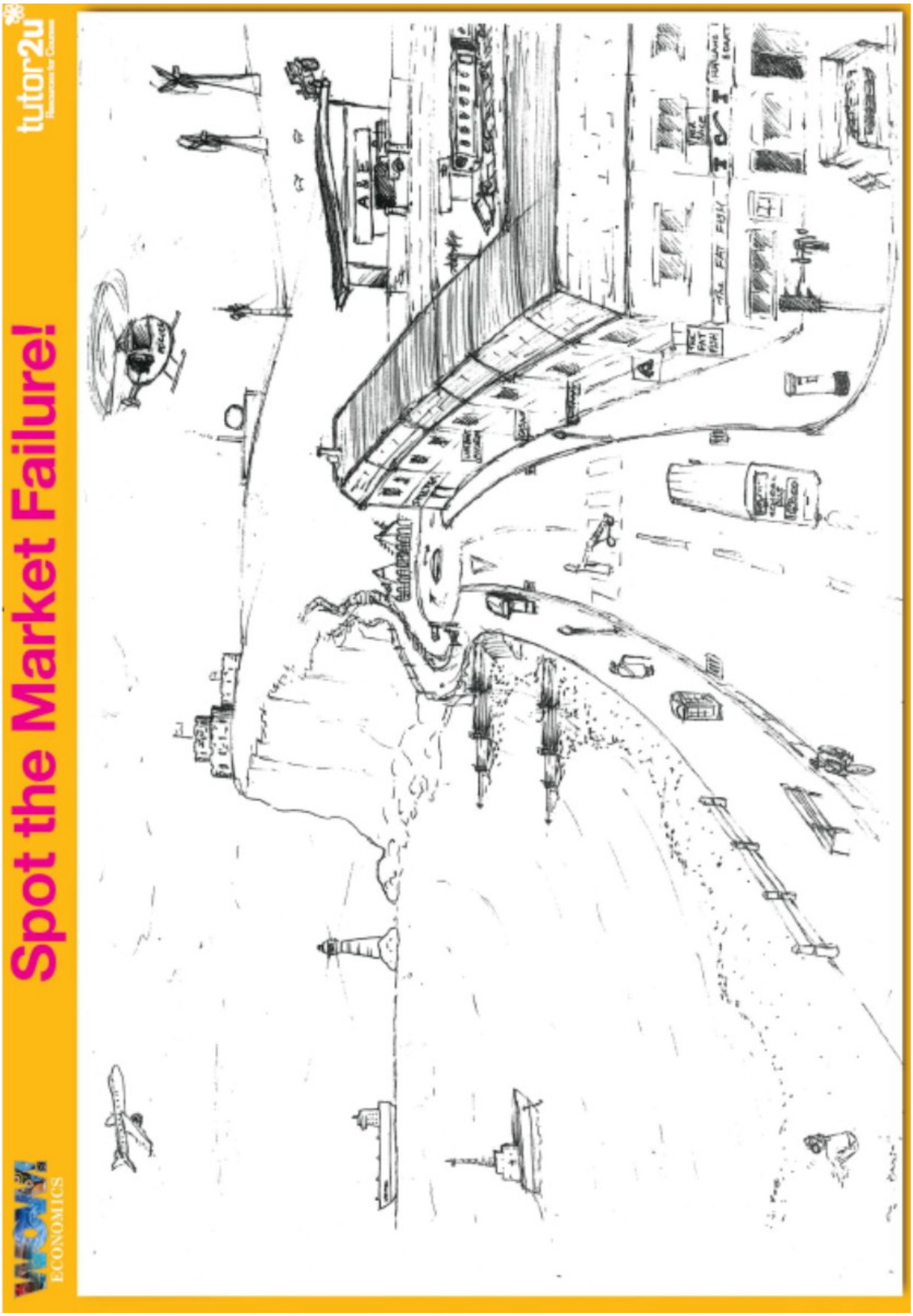
Answer ☐

2.

Government bailouts increase moral hazard by engendering a business climate in which companies feel they will be protected from the consequences of poor decisions and risky behavior. Because they no longer fear these consequences – at least not to the level they should – they often fail to take the proper precautions to guard against unnecessary risk. This lack of prudence frequently has far-reaching ramifications, including shareholder loss, insolvency, bankruptcy and dissolution. If decision makers are correct and the government steps in to bail the company out, consequences extend to everyone in society. Taxpayers shoulder the cost of bailouts, which also wreak havoc on government budgets. (Investopedia)

Explain how UK government bank bailouts in 2008 caused the problem of 'moral hazard'. (5)

➢ **Identify, state type and explain**



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GLOSSARY (tbc):

#	Term	Formula/explanation