Sample Papers – Set 1

AQA A Level – Paper 1 (Markets and Market Failure)

Answer Guide

This document is intended to support paper 1 of the first set of the EzyEconomics sample exam papers.

The answer guide provides a commentary on possible effective approaches to answer the sample exam questions.

Contents

AQA Micro Answer Guide

Question 1

Using the data in **Extract A**, calculate, to 1 decimal place, the percentage change in the average price of a single ticket from London to Exeter from 1995 to 2013. **[2 marks]**

There are two key steps to this question.

Step 1: Identify the important pieces of data from Extract A

The question asks about the average price of a single ticket from London to Exeter. Identifying the correct row allows us to pick out the values we need to answer the question.

Route	1995	2013
London to Manchester	£50	£154
London to Exeter	£37.50	£114.50
Swindon to London	£20	£58.50
Glasgow to London	£65	£169

The average price in 1995 was £37.50.

The average price in 2013 was £114.50.

Step 2: Accurately perform percentage change calculation

Begin with the correct formula for calculating a percentage change.

$$Percentage\ Change = \frac{New\ Value - Original\ Value}{Original\ Value} \times 100$$

We are asked to calculate the percentage change **from** 1995, so that is the original value, **to** 2013, so that is the new value.

$$Percentage\ Change = \frac{2013\ Price - 1995\ Price}{1995\ Price} \times 100$$

$$Percentage\ Change = \frac{£114.50 - £37.50}{£37.50} \times 100$$

$$Percentage\ Change = 2.0533 \ldots \times 100$$

$$Percentage\ Change = 205.33 \ldots \%$$

$$Percentage\ Change = 205.3\%$$

It is important to provide the answer accurately. The question asks for the answer to be given to **1 decimal place**. As it is a percentage change, a % sign is required.

Producing the correct answer will earn 1 mark.

Producing the correct answer **and** giving it to 1 decimal place with a % sign will earn 2 marks.

A summary sentence can often be useful to highlight the answer you have given. For example:

"The average price of a single ticket from London to Exeter increased by 205.3% between 1995 and 2013."

Question 2

Explain how the data in **Extract A** show how UK rail passengers have suffered due to the lack of 'on-rail' competition in the UK rail industry. **[4 marks]**

A good answer needs to include two key elements.

Step 1: Include some evidence

The evidence is most likely to be an example of train fares rising significantly between 1995 and 2013. It is important to specifically quote data from the extract. The following example does not achieve this:

"Extract A shows that rail fares rose sharply on several major UK rail routes"

A far better example of providing evidence is:

"Extract A shows that the average price of a single ticket on all 4 of the specified rail routes rose significantly between 1995 and 2013. For example, the average price of a single ticket from London to Manchester more than tripled from £50 in 1995 to £154 in 2013."

Quoting any of the 4 price increases would be acceptable.

Step 2: Provide a clear explanation

Having provided some evidence, your answer needs to explain why this evidence shows that UK rail passengers have suffered from a lack of 'on-rail' competition. To achieve top marks, this explanation needs to be clear and logical.

If your evidence has effectively identified the significant increase in ticket prices shown by Extract A, then an effective explanatory chain of reasoning might look like:

"These higher ticket prices mean that UK rail passengers are having to pay more to travel on trains. Some passengers will continue to buy tickets, forgoing other consumption, whilst others will no longer travel on the trains. Either way, these price increases will have caused a reduction in consumer surplus.

A lack of 'on-rail' competition may have contributed to these price increases as in its absence, Train Operating Companies enjoy monopoly power and are able to act as price makers and increase ticket prices."

There are other ways of achieving a good explanation. You would expect them to include:

1. Why higher ticket prices is bad for UK rail passengers.
2. Why a lack of 'on-rail' competition may have caused higher ticket prices.

It is important to be aware that the command work in this question is **'Explain'** and therefore detailed analysis and evaluation is not required. This question should take no longer than **6 minutes** to answer.

Providing accurate evidence is essential for earning marks on this question.

Once this has been provided, the mark awarded depends upon the quality and clarity of the explanation.

Question 3

Extract B, (lines 15-17) explains that an increase in passenger demand will put further pressure on an industry already at capacity.

With the help of a diagram, explain how increased passenger demand in the UK rail industry could affect the rail fares paid by passengers. **[9 marks]**

There are two key elements required within this answer:

A good (but not the only) approach to this question is:

Step 1: Introduction

Beginning by introducing the context and setting the scene for the diagram to follow allows you to display important knowledge and application skills alongside.

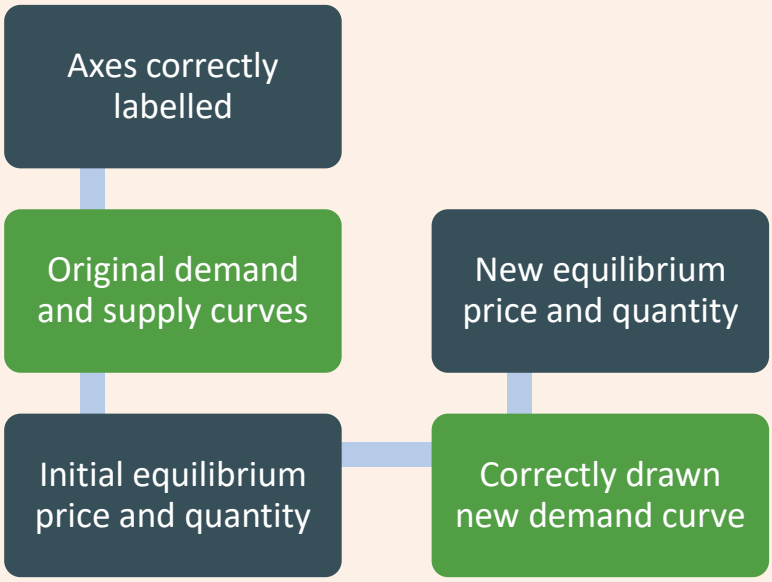
The example below makes a clear reference to the context, provides an appropriate and applied definition (of the demand for rail) and sets up the answer for the diagram by describing what we are trying analyse (increased passenger demand).

"Extract B predicts that "Over the next 30 years, passenger demand for rail will more than double". Demand for rail is the amount consumers are willing and able to pay to make rail journeys at a given price. Increased passenger demand for rail is likely to, assuming ceteris paribus, increase the rail fares paid by passengers. This can be explained by looking at a supply/demand diagram."

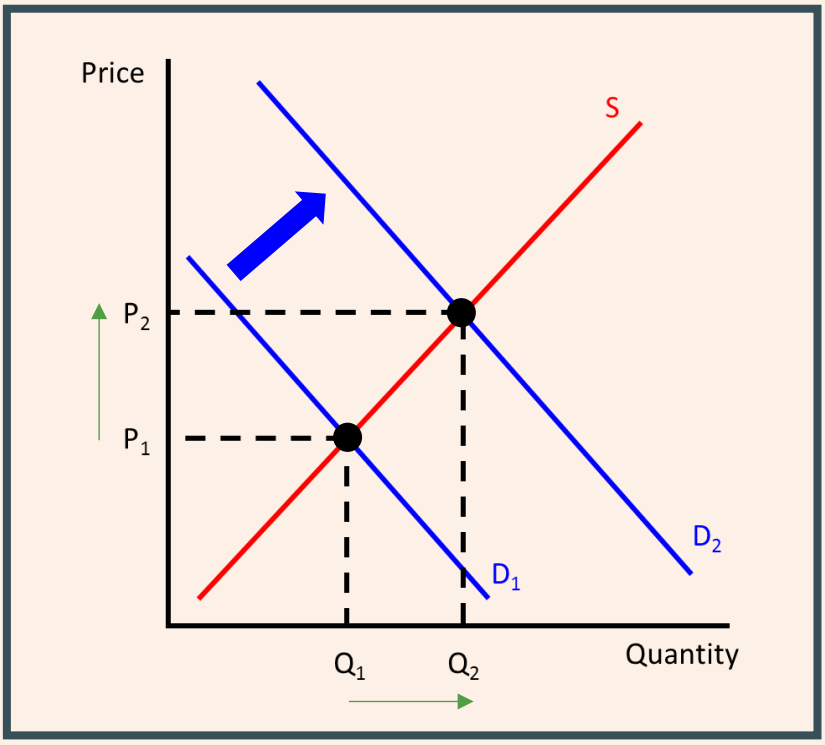
Step 2: Diagram

Here the question revolves around a change in demand. Therefore, the appropriate diagram is a demand/supply diagram.

In this case, for the diagram to be completed accurately, the following features have to be present:



Use a ruler and ensure the diagram is neat and tidy.



Step 3: Written Explanation

The first thing your written explanation needs to do is to clearly explain what your diagram shows. To assist clarity, it helps to refer to the labels you have given on your diagram. Where possible, the results of the diagram should be applied to the context of the question. For example:

"In the diagram above, the market for rail travel in the UK is depicted at an initial equilibrium of (Q_1, P_1) formed at the intersection of the original demand curve (D_1) and the supply curve (S). The increase in passenger demand is represented by an outwards shift in the demand curve from D_1 to D_2. At the original price level of P_1, there is now excess demand in the market which places an upwards pressure on prices. As a result, the market price increases until the market reaches a new equilibrium at (Q_2, P_2).

This new equilibrium results in more rail travel being undertaken as represented by the quantity increasing from Q_1 to Q_2 and ticket prices increasing from P_1 to P_2."

To achieve maximum marks, your answer needs to expand a little (but only a little) further than the accurate but basic analysis thus far offered. There are a variety of relevant issues which can be analysed including:

Different magnitudes of increased demand

- The increase in demand is unlikely to be uniform across all of the rail routes in the UK. Popular routes, such as the commuter routes into London and other major cities, are likely to experience larger increases in passenger demand than rural routes. As a result, the upwards pressure upon rail fares is likely to differ across the country.

Inelastic Price Elasticity of Supply

- The rail industry is likely to have a price inelastic supply due to the difficulty of building new rail tracks and the lack of spare capacity on many routes in the UK. This is especially likely to be the case in the short-run when it is difficult to expand supply by building new tracks and trains. A price inelastic supply would cause the increase in demand to cause a larger increase in ticket prices than a price elastic supply.

Excess Demand

- The increase in passenger demand on the railways may result in the market not reaching a new equilibrium, instead being in a situation of excess demand. This is likely to occur if the price mechanism doesn't respond by increasing prices enough to effectively perform its rationing function and therefore at the ticket price, more passengers want to travel than the train network can support.

Government Regulation

- Many train ticket prices in the UK are regulated by the government. The government might not allow train fares to increase due to the increased passenger demand.

Subsidies

- If the government intervenes by providing subsidies to the rail industry (above the level it currently provides), then this is likely to reduce the increase in ticket prices caused by increased passenger demand.

In your answer, you would not be expected to discuss many of these issues. A good strategy might be to attempt to introduce one issue with a clear chain of reasoning. This question does not examine your skills of evaluation, so you should focus upon using these issues **briefly** to push your analysis up to the top end! Your answer should take you no longer than **14 minutes.**

This question is marked on a levels basis. The overall quality of your response, including your diagram will be considered when deciding upon which level the answer is.
Level 1 [1 – 3 Marks] – Poor or no diagram alongside a brief and/or incoherent written explanation.
Level 2 [4 – 6 Marks] – Reasonable response which may include a diagram
Level 3 [7 – 9 Marks] – Organised and coherent response with an accurate and appropriate diagram.

Question 4

In **Extract C**, **(lines 12-16)** the Competition and Markets Authority argues that 'increased rail competition on selected routes will create additional consumer benefits'.

Using the data in the extracts and your own economic knowledge, assess the impact of introducing more competition on rail lines in the UK rail industry.

[25 marks]

To access top marks in any economics essay, it is important to focus on two key elements:

As essay structure is a more general skill, we will focus on showcasing how to hit the different assessment objectives required for this specific question. However, hopefully the following discourse will provide some assistance with regards to essay structure.

AO1: Knowledge

Being able to display accurate knowledge is judged to be the most basic requirement. It is still important to be able to demonstrate accurate knowledge throughout your essay. You can signpost this by including accurate definitions. For example, in your introduction you might want to provide a definition of competition. For example:

"The amount of competition within a given market is the extent to which there are rival suppliers of the same good, each attempting to attract consumers in the face of each other's presence."

AO2: Application

Being able to apply your knowledge is particularly important for essays within data response questions. In this case the question particularly asks about the impact of introducing competition within the UK rail industry. Utilising the data extracts can provide some helpful angles to use in order to demonstrate that you are applying economic theory to this particular market. Some examples are:

Extract A and Extract C - Lines 8-11

- The ticket price data shows that prices on major routes in the UK have risen rapidly over the last couple of decades.
- This could be used to show that a lack of 'on-rail' competition may have resulted in bad results for consumers.

Extract B - Lines 8-10 and Extract C - Lines 1-4

- This explains that before a Train Operating Company (TOC) can provide train services on a line, they do engage in some competition, at the stage of applying for the franchise.
- This could be used as a slight rebuttal to the notion that there is no competition and to introduce some discussion about the nature of the market structure.

Extract B - Lines 11-17

- This explains that passenger demand within the UK rail market has increased significantly and is expected to continue to increase.
- This could be used to evaluate the relative importance of some of the costs and benefits of introducing more competition. Increased passenger demand may make securing increased investment the most important priority.

Extract C - 17-22

- This provides the example of the East Coast mainline which has been opened up to increased 'on-rail' competition.
- This can be used to support the conventional theory that competition leads to lower prices and better services.

:

Extract C - Lines 23-25

- This explains that the typical profit margin is around 3% and that there are some fears that increased competition may cause fewer firms to compete for TOC franchises.
- This could be used as an evaluation of the conventional theory of firms with monopoly power charging monopoly prices and earning supernormal profits.

You are only expected to use some of these application examples in your essay. You can also introduce application via your own knowledge of the UK rail market. Some examples are:

Inelastic PED

- Many rail passengers in the UK are commuters who have little or no alternative method of travelling to work. This lack of substitutability is likely to mean that PED in this market is inelastic, especilly for peak-time tickets.

Inelastic PES in short-run

- Increasing the supply of trains may be very difficult in the short-run as it would require building more trains and/or laying more tracks, both of which require significant long-run investment. This is likely to mean that supply is inelastic, at least in the short-run.

Government Subsidies

- The government currently intervenes in the market by providing significant subsidies and funding the operation of Network Rail, the public sector organisation in charge of improving and repairing the UK's tracks.

Regulated Prices

- Some ticket prices are heavily regulated by the government with a quasi-maximum price being set.

Natural Monopoly

- In can be argued that much of the UK rail industry is a natural monopoly, at least to some extent. This can be applied somewhat to 'on-rail' competition by explaining that only a certain number of trains can travel on a route at a given time without duplicating the infrastructure (tracks, stations etc) of the railways.

As ever, you only need to include some of these issues. Indeed, some of these application examples are quite high-level and would only be expected of highly sophisticated answers.

AO3: Analysis

The core of top-level essays consists of well-constructed, relevant analysis of the topic. This should be presented using logical chains of reasoning, and where appropriate, clear diagrams.

There are lots of analytical routes you could go down with a question like this. The core analysis will involve an explanation of the theory of competitive markets, in comparison to uncompetitive markets. A good (but not the only) approach would be to consider the traditional theory of monopoly markets and then consider the outcomes of a perfectly competitive market. The argument can then be made that introducing 'on-rail' competition will shift the market along the spectrum from a monopoly towards perfectly competitive outcomes.

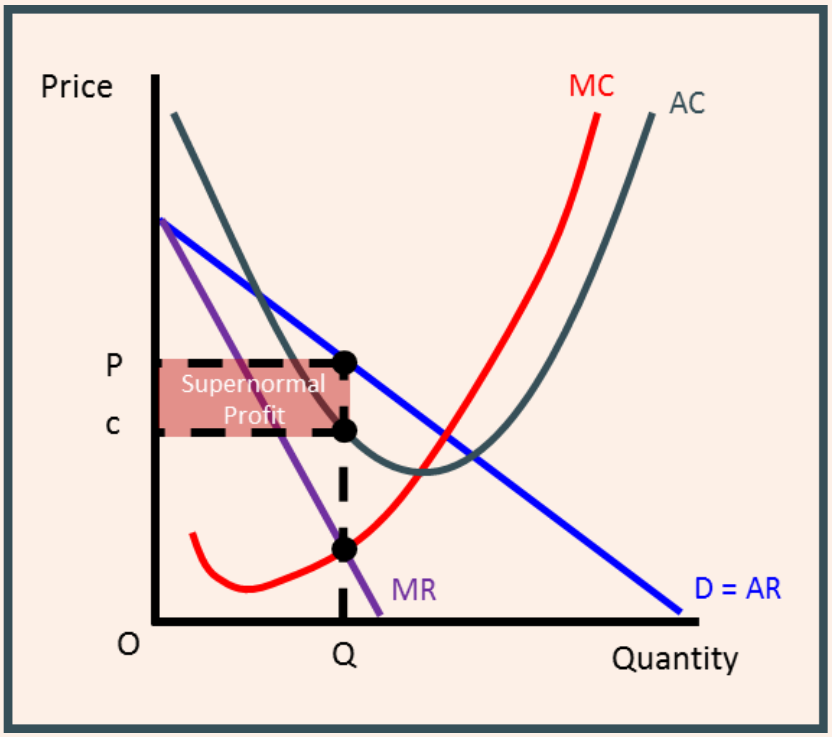
Monopoly Markets

In the absence of 'on-rail' competition, the UK rail industry can be argued to be a monopoly market, with only one Train Operating Company (TOC) available to a passenger travelling on a particular route. The following is a good example of a chain of reasoning which attempts to explain the implications of this:

"In the absence of competition on the particular routes they serve, Train Operating Companies (TOCs) are likely to hold some monopoly power. This will allow them to act as 'price makers' rather than 'price takers', setting the price which will maximise profits. This is likely to be above the price which would be set by a perfectly competitive market, leading to higher ticket prices for consumers and higher (supernormal) profits for firms."

This chain of reasoning would be very well-supported by the standard monopoly diagram which shows these results. This shows the TOC facing the demand curve of the whole market, alongside the separate, steeper MR curve. The monopolist profit-maximises by producing where MR = MC and charges a price P, which enables it to earn supernormal profit as shown by the shaded red area.

The monopolist is neither productively efficient, as it does not produce at the minimum point on the AC curve, not is it allocatively efficient as the price does not equal marginal cost.



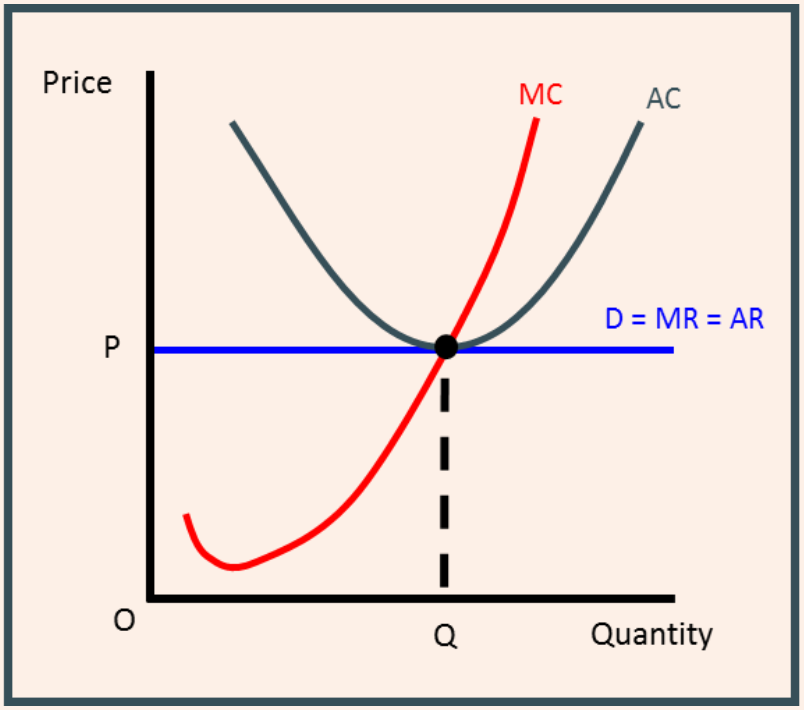
Perfectly Competitive Markets

Perfect competition represents a theoretical market structure which contains an infinite number of buyers and sellers, one homogenous good, no barriers to entry or exit and perfect information. It is useful to include an analysis of a perfectly competitive market to compare against the outcomes of a monopoly market. After introducing what a perfectly competitive market is and why it is useful to discuss it in answering this particular question, the following chain of reasoning could be used to explain the results of perfect competition:

"In a perfectly competitive market, firms are price takers, not price makers. This means that they must accept the prevailing market price as the infinite number of competitors they face prevents them from charging more than the market price. This market price is likely to be lower than the price charged by a monopoly firm and in the long-run is set at the level whereby firms make normal profits."

Other relevant results about perfect competition include the facts that firms are both productively and allocative efficient and that consumers have a wide range of firms to choose from.

The typical perfect competition diagram (see below) could be used here to support the analysis, although if the monopoly diagram is also included in your essay you may decide to omit it in order to avoid spending too long on your answer to this question.



Having discussed the results of a monopoly market and a perfectly competitive market, the question itself can now be answered by explaining that the move to introduce more on-rail competition represents a shift down the spectrum of market structures from a monopoly towards a perfectly competitive market.

Increasing Competition

This results of this shift can largely be analysed by comparing the results of the monopoly market and the perfectly competitive market.

Lower Prices

- Passengers are likely to face lower prices, increasing their consumer surplus.

Higher Output

- Lower prices will cause a movement down the demand curve, inducing more journeys to be taken by rail.

Non-Price Competition

- In addition to competition putting downward pressure on prices, it is likely to also encourage firms to improve their levels of service.

More Efficient

- The market is likely to be more allocatively and productively efficent, ensuring a better overall utilisation of economic resources.

Smaller Profits

- Firms no longer earn supernormal profits, instead being restricted (in the long-run) to normal profits in the extreme case of perfect competition.

AO4: Evaluation

Including accurate and relevant evaluation in your essay is the most important thing to ensure you achieve top marks. Evaluation is the art of making supported judgements, of deciding which factors are most important and providing a counterargument against some of the analytical points made in the essay.

There a huge number of evaluative angles you could take within this essay. Here we will showcase some useful examples. You would not be expected to include all of these examples – there simply is not enough time!

The extent of the increase in Competition

- The question alludes to introducing more competition without explaining how that would be achieved. The extent to which competition is introduced will affect how far down the market structure spectrum towards perfect competition the market moves. It may be that it is difficult to effectively increase the level of competition due to the nature of the industry, where train companies would have to share a limited amount of track and station facilities.

The Short-Run

- Whilst a move towards a more competitive market suggests that there would be a stable market with all of the consumer and efficiency benefits that perfect competition suggests in the long-run, in the short-run there may be volatility. Increased competition might result in initially too many or too few firms entering the market, thereby not allowing the market to initially reach the efficient market equilibrium. Volatility may affect the reliability and stability of services, affecting passengers who may rely upon these services for essential travel.

The Importance of Investment

- Monopoly markets allow firms to make supernormal profits. These supernormal profits allow firms to invest in research&development or increased investment, safe in the knowledge that this will allow them to enjoy supernormal profits in the future. The prospect of earning only normal profits in the future due to competition may discourage firms from making important investment committments inclduing imporvements to stations and increasing the number and quality of trains in service. This may be more important than any consumer and efficiency benefits from competition due to the importance of investing in expanding the scale of the UK railways to cope with future demand. This is related to the concept of dynamic efficiency as it might improve productive efficiency over time.

Government Intervention

- The extent to which increased competition would deliver the theorised consumer and efficiency benefits depends upon the extent and nature of government intervention in the market. If, for example, the government continued the practice of implementing price controls (through regulated fares) then the ability of market competition to reduce prices might be limited.

The extent of current inefficiency

- Extract C (Line 26) states that the typical profit margin currently for a Train Operating Company is only 3%. This could be argued to demonstrate that firms have less monopoly power than might be first imagined and therefore the level of inefficiency initially is smaller than would otherwise by thought.

Inelastic PED

- This increases the incentive for monopolists to exercise their monopoly power and set high prices as doing so results in few passengars lost.

Externalities of Substitutes

- An increase in competition is likely to increase the output (number of journeys) of the market. This might have a higher social benefit than first imagined as a common substitute to train travel is to drive. Driving produces negative externalities including increased emissions and congestion.

Overall, it is important to provide in your essay, a reasoned judgement; an argument which makes a decision about whether introducing more competition within the UK rail industry would, overall, be good or bad. It doesn't matter which side of the argument you make the case for – you will be examined on how effectively you structure that argument and how well you support it with economic theory.

The concluding paragraph of your essay is often a very good place to make clear what your overall reasoned judgement of the question is. Some people also like to include a similar judgement in their introduction, to signpost clearly to the examiner that they will be making an evaluative judgement in their essay.

Here is a good example of an attempt to, in one paragraph, argue that introducing more competition would be good for the industry:

"Overall, the case for introducing more competition into the UK rail industry is persuasive. Despite the fact that the arguments regarding the potential dynamic efficiency benefits of monopolist earning supernormal profits deserve consideration, the current market failure of productive and allocative inefficiency should take priority. This is especially so because long-suffering commuters often have few privately or socially appealing substitutes to train travel and thus their demand is likely to be price inelastic, making the likelihood of monopoly pricing more likely and more important to act against."

Alternatively, it would be just as valid to argue that introducing more competition would be a negative development:

"On balance, introducing more competition into the UK rail industry would not be beneficial to the market. The allure of introducing more competition revolves around increasing static efficiency and increasing consumer here and now. Despite the importance of these factors, the most pressing issue for the UK rail industry is its future. Its ability to accommodate increasing demand is a matter of vital importance and can only be guaranteed by incentivising firms to invest in more trains and improving services through the prospect of enjoying supernormal profits as a monopolist now and in the future."

Essays are marked on a levels basis. The overall quality of your essay will be considered when deciding upon which level the answer is.
Level 1 [1 – 5 Marks] – Very weak response which includes little relevant content.
Level 2 [6 – 10 Marks] – Weak response which shows some understanding but undeveloped analysis.
Level 3 [11 – 15 Marks] – Reasonable analysis but poor evaluation, which is usually unsupported.
Level 4 [16 – 20 Marks] – A well organised response with good analysis and some reasonable evaluation.
Level 5 [21 – 25 Marks] – A well organised response with good analysis and supported evaluation throughout

Question 5

Using the data in **Extract D**, calculate, to 1 decimal place, the percentage change in the average annual price of a barrel of oil from 2013 to 2016.

[2 marks]

There are two key steps to this question.

Step 1: Identify the important pieces of data from Extract D

The question asks about the average annual price of a barrel of oil in 2013 and 2016. We can identify these pieces of data from the table in Extract D.

	Year			
Variable	2013	2014	2015	2016
World Oil Demand (mb/d)	92.0	93.2	95.0	96.2
World Oil Supply (mb/d)	90.4	93.8	96.6	97.8
Oil Price ($ per barrel)	105.9	96.3	49.5	38.4

The average annual price per barrel in 2013 was $105.9

The average annual price per barrel in 2016 was $38.4

Step 2: Accurately perform percentage change calculation

Begin with the correct formula for calculating a percentage change.

$$Percentage\ Change = \frac{New\ Value - Original\ Value}{Original\ Value} \times 100$$

We are asked to calculate the percentage change **from** 2013, so that is the original value, **to** 2016, so that is the new value.

$$Percentage\ Change = \frac{2016\ Price - 2013\ Price}{2013\ Price} \times 100$$

$$Percentage\ Change = \frac{\$38.4 - \$105.9}{\$105.9} \times 100$$

$$Percentage\ Change = -0.6373 \ldots \times 100$$

$$Percentage\ Change = -63.73 \ldots \%$$

$$Percentage\ Change = -63.7\%$$

Note that the answer is negative, representing the fact that this is a percentage **decrease**.

It is important to provide the answer accurately. The question asks for the answer to be given to **1 decimal place**. As it is a percentage change, a % sign is required.

Producing the correct answer will earn 1 mark.

Producing the correct answer **and** giving it to 1 decimal place with a % sign will earn 2 marks.

Not including an indication that this is a percentage decrease, for example a negative sign, may prevent 2 marks being awarded.

A summary sentence can often be useful to highlight the answer you have given. For example:

"The average annual price of a barrel of oil decreased by 63.7% from 2013 to 2016."

Question 6

Explain how the data in **Extract D** show how the OPEC cartel's market power in the oil market has decreased. **[4 marks]**

A good answer needs to include two key elements.

Step 1: Include some evidence

A good approach to extracting evidence from Extract D would be to focus on the fact that world oil supply has increased through the entire period despite the fact that the oil price has fallen. It is important to specifically quote data from the extract. The following example does not achieve this:

"Extract D shows that world oil supply rose between 2013 and 2016."

A far better example of providing evidence is:

"Extract D shows that the world oil supply rose every year between 2013 and 2016, increasing from 90.4 million barrels per day (mb/d) in 2013 to 97.8 mb/d in 2016. This occurred despite the fact that the world oil price was falling each year throughout the same period, from a high of $105.9 per barrel in 2013 down to $38.4 per barrel in 2016."

An alternative approach might be to focus upon excess demand and excess supply. Again, it is important to specifically quote data from the extract. The following example does not achieve this:

"The world oil market has excess demand in 2013 but a couple of years later the market had excess supply."

A far better example of providing evidence is:

"Extract D shows that in 2013 the world oil market had excess demand but in the 3 years that followed this had changed so that the market had excess supply. In 2013, the world oil demand was 92.0 million barrels per day (mb/d),

1.6 mb/d more than the world oil supply of 90.4 mb/d. In contrast, by 2016, the world oil demand was 96.2 mb/d, 1.6 mb/d less tham the world oil supply of 97.8 mb/d.

Having provided some evidence, your answer needs to explain why this

Step 2: Provide a clear explanation

evidence shows that OPEC's market power has decreased. To achieve top marks, this explanation needs to be clear and logical.

If your evidence has effectively identified the fact that world oil supply increased faster than world oil demand over the period considered, then an effective explanatory chain of reasoning might look like:

"When the world oil price falls, you would expect the OPEC cartel to restrict supply in order to stabilise prices and avoid lower prices impacting upon their revenues. The fact that over the period between 2013 to 2016, world oil supply increased faster than world oil demand in face of falling world oil prices suggests that OPEC were unable to exert significant control over supply to prevent the oil price continually falling. This may be the result of a decrease in OPEC's market power as a result of alternative supplies of oil including the fracking industry in the US."

There are other ways of achieving a good explanation. You would expect them to include:

1. Why OPEC would want to prevent the world oil price continuously falling.
2. Why supply and demand data suggest that they haven't been able to achieve this.
3. Why this suggests that OPEC's market power has fallen.

It is important to be aware that the command work in this question is **'Explain'** and therefore detailed analysis and evaluation is not required. This question should take no longer than **6 minutes** to answer.

Providing accurate evidence is essential for earning marks on this question.

Once this has been provided, the mark awarded depends upon the quality and clarity of the explanation.

Question 7

Extract E, (lines 18-179) states that world oil supply has increased above oil demand creating a 'supply glut' in the market. With the help of a diagram, explain how the increase in world oil supply has put pressure on world oil prices to fall. **[9 marks]**

There are two key elements required within this answer:

A good (but not the only) approach to this question is:

Step 1: Introduction

Beginning by introducing the context and setting the scene for the diagram to follow allows you to display important knowledge and application skills alongside.

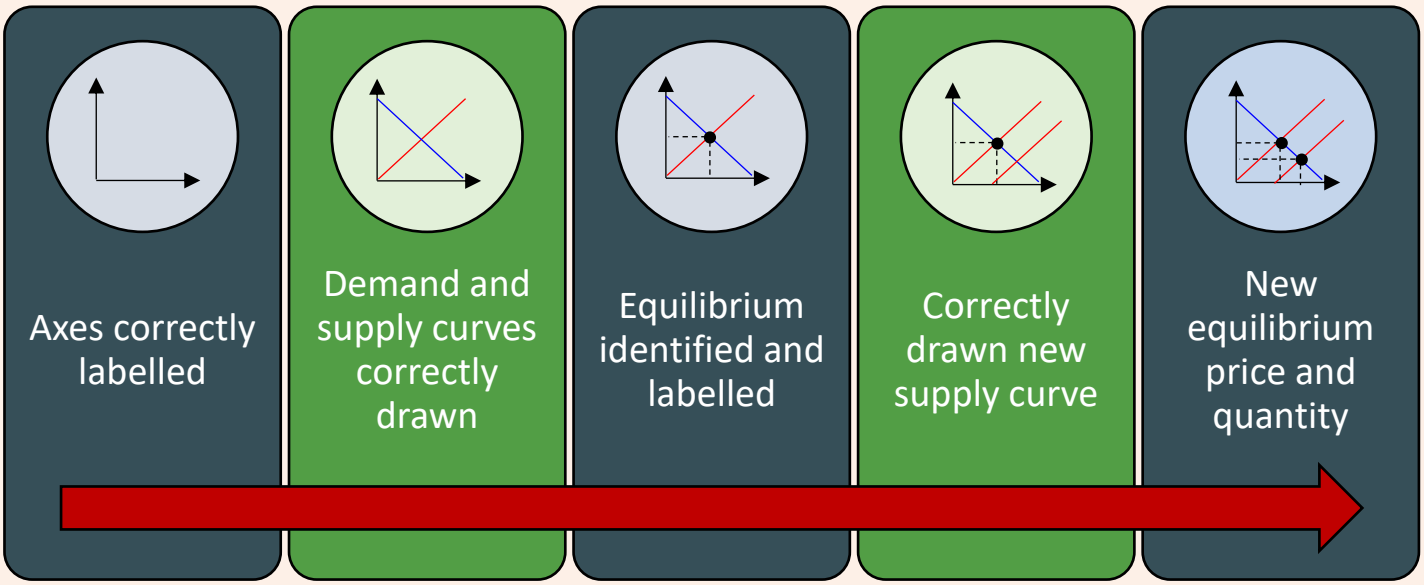
The example below makes a clear reference to the context, provides an appropriate and applied definition (of the world oil supply) and sets up the answer for the diagram by describing what we are trying analyse (increased oil supply).

"Extract E details that the downward pressure on oil prices can be partially explained by increased supply from the US and Russia. The world supply of oil can be defined as the combined quantity of oil all of the produces around the world are willing and able to produce at a given price. Increased supply of oil is likely to, assuming ceteris paribus, reduce the world oil price. This can be explained by looking at a supply/demand diagram."

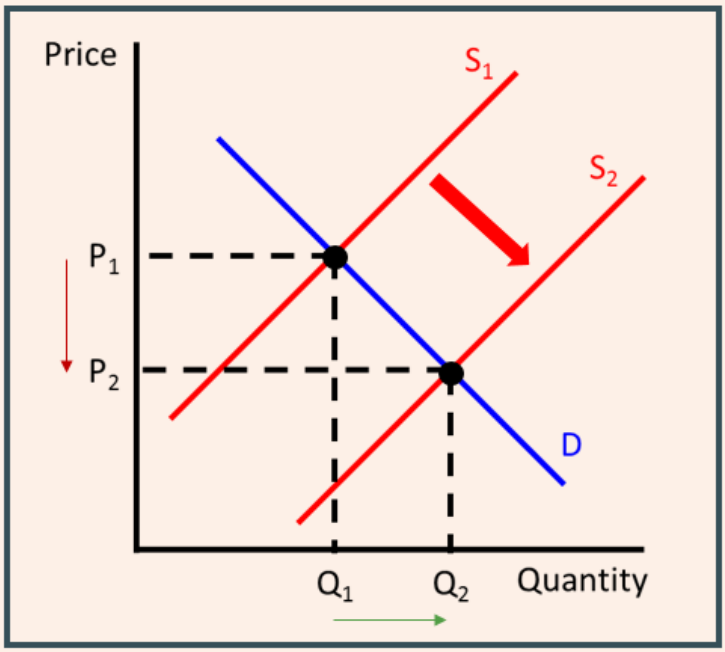
Step 2: Diagram

Here the question revolves around a change in supply. Therefore, the appropriate diagram is a demand/supply diagram.

In this case, for the diagram to be completed accurately, the following features have to be present:



Use a ruler and ensure the diagram is neat and tidy.



Step 3: Written Explanation

The first thing your written explanation needs to do is to clearly explain what your diagram shows. To assist clarity, it helps to refer to the labels you have given on your diagram. Where possible, the results of the diagram should be applied to the context of the question. For example:

"In the diagram above, the world market for oil is depicted at an initial equilibrium of (Q_1, P_1) formed at the intersection of the original demand curve (D) and the supply curve (S_1). The increase in oil supply results in a shift of the supply curve from S_1 to S_2. At the original price level of P_1, there is now excess supply in the market which places a downwards pressure on prices. As a result, the market price decreases until the market reaches a new equilibrium at (Q_2, P_2).

This new equilibrium results in more oil being consumed as represented by the quantity increasing from Q_1 to Q_2 and the price paid per barrel for oil falling from P_1 to P_2."

To achieve maximum marks, your answer needs to expand a little (but only a little) further than the accurate but basic analysis thus far offered. There are a variety of relevant issues which can be analysed including:

Slowdown in demand for oil

- Extracts D and E both highlight that the increase in oil supply has been accompanied by a slowdown in the growth of oil demand. This could be incorporated into the analysis by way of a diagram which depicts both an outwards shift in the supply cure and an inwards shift in the demand curve. Both of these shifts work in the same direction, causing the price to fall.

Inelastic Price Elasticity of Demand

- The demand for oil is likely to be price inelastic as for many of its uses, it is considered a necessity. As a result the outwards shift in the supply curve is likely to cause a large decrease in price. This can be supported by evidence of the massive decrease in the oil price shown by Extract D.

Excess Supply

- The data from Extract D shows that the world oil market is at no point at equilibrium, rather in 2016 there is still excess supply. As a result, this persistent excess supply may cause further downwards pressure on prices until it reaches a new equilibrium price.

Alternative Energy Sources

- Alongside the slowdown of economic growth and demand for oil from developing economies like China, the growth of new energy sourses like renewable energy and electric cars may have further reduced the demand for oil, placing addition downwards pressure on prices.

In your answer, you would not be expected to discuss many of these issues. A good strategy might be to attempt to introduce one issue with a clear chain of reasoning. This question does not examine your skills of evaluation, so you should focus upon using these issues **briefly** to push your analysis up to the top end! Your answer should take you no longer than **14 minutes.**

This question is marked on a levels basis. The overall quality of your response, including your diagram will be considered when deciding upon which level the answer is.

Level 1 [1 – 3 Marks] – Poor or no diagram alongside a brief and/or incoherent written explanation.

Level 2 [4 – 6 Marks] – Reasonable response which may include a diagram

Level 3 [7 – 9 Marks] – Organised and coherent response with an accurate and appropriate diagram.

Question 8:

In **Extract F, (lines 12-15)** concerns were raised over how effective OPEC's production quota would be in correcting the disequilibrium in the world oil market.

Using the data and your own economic knowledge, evaluate how effective OPEC's production cut is likely to be at raising the worldwide market price of oil.

[25 marks]

To access top marks in any economics essay, it is important to focus on two key elements:

As essay structure is a more general skill, we will focus on showcasing how to hit the different assessment objectives required for this specific question. However, hopefully the following discourse will provide some assistance with regards to essay structure.

AO1: Knowledge

Being able to display accurate knowledge is judged to be the most basic requirement. It is still important to be able to demonstrate accurate knowledge throughout your essay. You can signpost this by including accurate definitions. For example, in your introduction you might want to provide a definition of a production quota in the context of the OPEC cartel. For example:

"OPEC producers act as a cartel, in the sense that given their large market share of the oil market they can influence the price of oil by coordinating production decisions and managing the supply of oil to stabilise the market price. One way this can be achieved is through a production quota.

Production quotas are fixed production targets applied to the producers of a good, set by the government or an organisation within the industry. Quotas can be either set high to encourage production, or can be used to restrict production to support and maintain a price level."

AO2: Application

Being able to apply your knowledge is particularly important for essays within data response questions. In this case the question asks about the effectiveness of an oil production cut in raising world oil prices. Utilising the data extracts can provide some helpful angles to use in order to demonstrate that you are applying economic theory to this particular market. Some examples are:

Extract D and Extract E - Lines 8-10

- The data from the oil industry shows that the average annual price of a barrel of oil on the world market has fallen dramatically since 2013.
- This could be used to show that oversupply in the world oil market has exerted significant downward pressure on oil prices.

Extract D and Extract E - Lines 8-10

- This explains that a combination of factors - supply and demand factors - have contributed to the fall in the price of oil.
- This can be used to show that the oversupply in the market has been caused by not only world oil supply increasing from oil producers but also due to demand weakening for oil. The data in extract D provides an estimate of over the overcpacity in the world oil market at 1.6mb/d.

Extract E - Lines 11-13

- This explains that global demand has weakened primarily because of a slowdown in large commodity importers such as China and this slowdown is predicted to continue to increase.
- This could be used to evaluate the relative importance of oil as a commodity for producers, as many fast growing Asian economies have returned to normal levels of growth.

Extract E - 14-17

- This provides an explanation behind the increased supply of oil on the world market.
- This can be used to discuss the fact that the global supply of oil may continue to increase as a result of investment projects channelled towards developing this industry when oil prices were once high.

Extract F - Lines 7-11

- This explains OPECs strategy towards continuing to increase the supply of oil even when prices were low to maintain market share ahead of profits.
- This can be used to evaluate the intentions and credibility of the production cut brought forward by OPEC.

Extract F - Lines 12-15

- This explains some of the concerns over the effectiveness of the planned production cut announced by OPEC.
- This can be used as an evaluation point about whether OPEC still has the same influence over the market to stabilise prices as they have done in the past, as a result of increased market share from non-OPEC producers.

You are only expected to use some of these application examples in your essay. You can also introduce application via your own knowledge of the world oil market. Some examples are:

Inelastic PED

- Traditionally the demand for oil has been relatively inelastic as oil has very few close and direct substitutes available to consumers. It also remains a key commodity required to support the production process of many goods produced in the manufacturing and construction industries. This explains why even during periods when oil prices were high, demand was still increasing.

Interrelationships between markets

- Derived demand is when the demand for one good or service is dependent on the demand for another good or service. The demand for oil is largely derived from the demand for products which can be produced only from oil, like petrol and diesel. As a result, when considering the oil market, ther markets from where oil derives its demand may also have to be considered.

Inelastic PES in short-run

- Increasing the supply of oil may be very difficult in the short-run as it would require investing more into developing expensive infrastructure in the industry such as oil wells, refineries and pipes. There is also a time lag between the time the infrastructure is put into place and when the first barrel of oil is produced. This means it takes longer for the oil supply to respond to changes in price.

Cartel

- In can be argued that OPEC is an example of a cartel as it produces a third of the world's oil supply and therefore can influence the market price by adapting its production and investment decisions. It has been argued that this cartel has in the past used its dominant market position to increase producer surplus at the expense of consumer surplus.

Shut-Down Points

- OPEC producers typically have large built-up retained profits - due to the length of time they have operated in the market. This profit has been partially used to reduce the marginal cost of production over time, which means OPEC producers have a break-even point far below that of new and more unconventional oil producers. This gives OPEC producers the ability to undercut US shale rivals.

Alternative Oil Extraction Methods

- The development of the US shale industry has increased the supply of oil rapidly as a result of the development in fracking techniques. Fracking allows firms to access reserves of oil which would have been unobtainable previously, by injecting highly pressurised gas underground to disturb the geological formations.

As ever, you only need to include some of these issues. Indeed, some of these application examples are quite high-level and would only be expected of highly sophisticated answers.

AO3: Analysis

The core of top-level essays consists of well-constructed, relevant analysis of the topic. This should be presented using logical chains of reasoning, and where appropriate, clear diagrams.

There are lots of analytical routes you could go down with a question like this. The core analysis will involve an explanation of the theoretical impact a production cut would have on the world oil market if honoured by all firms. A good (but not the only) approach would then be to consider the impact that higher oil prices will have on firms' shut-down decisions and therefore the future course of direction for oil prices. The argument can then be made that higher oil prices could in fact force higher cost US shale producers back into the market and oil prices could then be liable to fall once again.

In this question, it may help to first set the scene regarding the downward movement of oil prices over time. The focus here should be on the existing strategy that OPEC producers have taken. An example of this is:

"In the absence of a production cut, oil prices have continued to decline and fell as low as $27 at the start of 2016, due to a combination of increasing global supply by the major oil producing countries and weakening global demand for commodities from the global economy. The increased production from US shale producers, because of the increased development of the fracking industry, has resulted in the market share of OPEC producers to diminish over time.

The falling market share of OPEC producers has not only limited the ability of OPEC producers to stabilise market prices but has also reduced their profitability from the sale of oil on the world market. Therefore, to protect their market share, OPEC producers have taken the surprising but controversial production decision to continue to increase the supply of oil to protect their market share and to induce the exit of high cost US shale producers over time, as these firms do not have a large cash reserves to fall back on.

This is a change in strategy for OPEC producers, as since the 1960s they have effectively run as a cartel to use their market position to ensure that oil prices are stable and the market provides stability in supply for oil consumers, consistent and steady income for producers and a decent return to investors in energy companies."

Production Cut

A production cut which aims to reduce OPEC oil production, as well as encourage the participation of non-OPEC oil producers, is likely to result in less oil being supplied to the world market, which will help reduce the excess supply currently present. The following is a good example of a chain of reasoning which attempts to explain the implications of this:

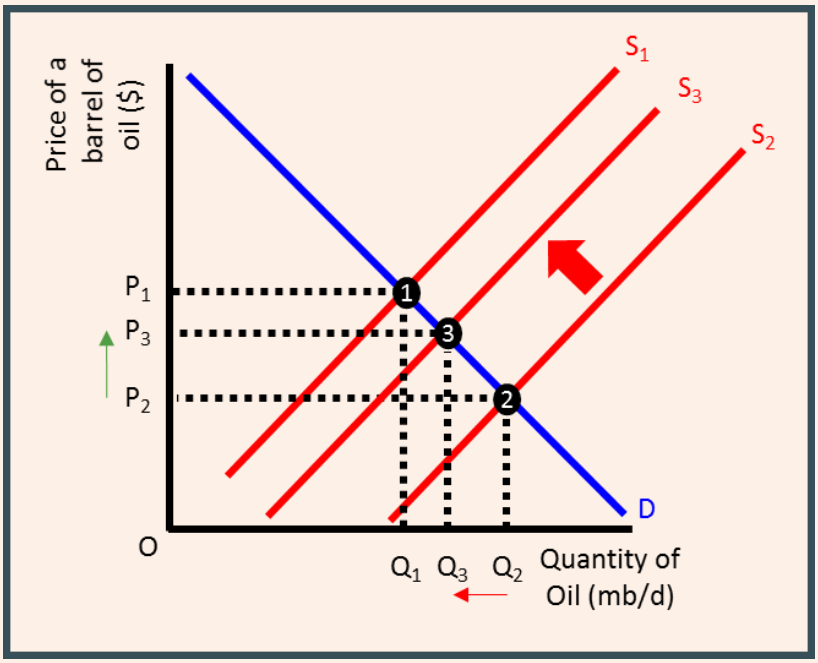
"The decision for OPEC to announce their first oil production cut in 8 years is a signal that the strategy stance taken to induce the exit of unconventional US shale producers out of the market has not been a successful one – it has contributed to the fall in world oil prices and actually eroded the market position for all oil producing firms involved.

The production cut will aim to reduce OPEC oil production by 1.2 million barrels a day and help encourage a collaborative approach towards maintaining stable oil prices for all. Assuming ceteris paribus, the production cut will contribute towards removing the excess supply of 1.6 million barrels a day and the price of oil should, as a result, rise."

This chain of reasoning would be very well-supported by a standard demand and supply diagram. The diagram shows the original equilibrium **(1)** when oil prices were high and there was a different balance between supply and demand. Increased global supply created an outwards shift in the supply curve for oil to S_2. This applied downwards pressure on prices to fall and a movement was made down the demand curve to settle at a new equilibrium **(2)** where prices are lower **(P_2)** but the number of barrels of oil produced is higher **(Q_2)**.

The production cut by OPEC creates an inward supply curve shift to S_3, as at every given price OPEC will be supplying less oil to the market. Assuming ceteris paribus, this creates a movement up the demand curve and a new equilibrium is reached **(3)** where oil prices are higher **(P_3)** and the number of barrels of oil produced are lower **(Q_3)**.

Here the inwards shift in the supply curve caused by OPEC's tighter quota is represented as being smaller than the previous outwards shift in order to illustrate that the quota does not affect non-OPEC producers and as such is unlikely to be as significant.



Higher Oil Prices

Having discussed the theoretical results of a production cut using a supply and demand diagram, this gives you a brief opportunity to talk about some of the wider impacts that this will have.

Higher Profits

- All oil producers in the market will make higher supernormal profits as the margin on each barrel of oil sold increases.

Higher Prices

- Because oil is a commodity used in the production process of a lot of goods, if the price of oil increases this is likely to increase the cost of producing goods and services and therefore consumers will have to pay higher prices e.g. petrol and diesel prices.

Lower Demand for oil related products

- If the price of oil increases it will lead to the demand of products produced with oil to fall due to the inverse relationship between price and demand.

Shut-Down Points

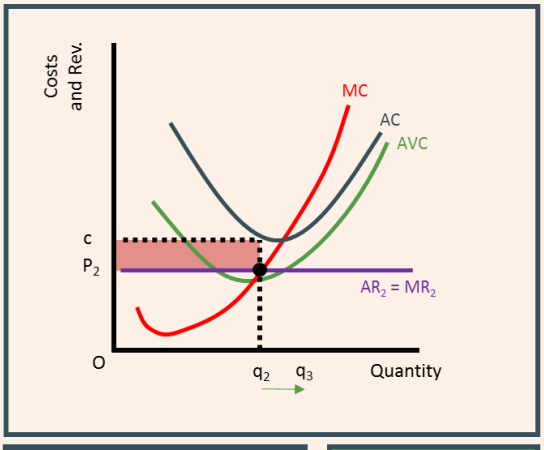
A useful angle to consider is the impact that high oil prices will have on the unconventional US shale producers. This is important because a growing contributor to the initial excess supply of oil was the increased market presence of US shale producers, who have been able to participate in the market due to the traditionally high oil price.

All other things being equal, the marginal cost of production for OPEC producers is lower than US shale producers. This because the extraction costs that result from fracking are currently higher than the extraction costs of using traditional oil wells and refineries. Therefore, the lower oil price has caused significant stresses upon companies operating the new US shale methods. Receiving lower average revenue moves these firms closer to their shut-down points.

However, if OPEC production cut causes the oil price to increase, this will relieve the pressure on US shale producers and potentially encourage more US shale firms to enter the market and existing shale producers to increase investment and expand their capacity. This may perversely result in a higher world supply within the next few years, which ultimately could reverse any rise in the oil price caused by OPEC's decision.

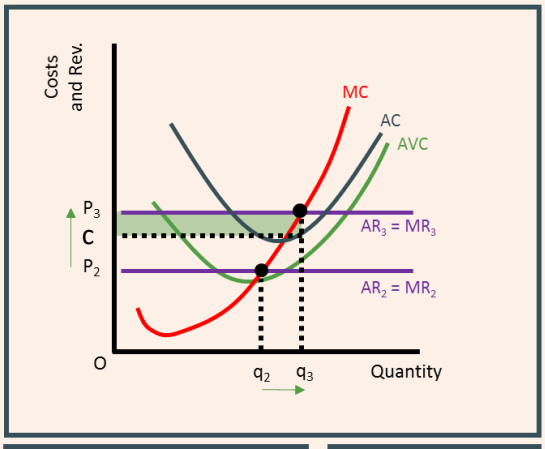
US Shale Producer

Low Price



Firm shuts-down in LR — AR < AC

High Price



Firm does not shut-down — AR > AC

This diagram demonstrates the effect that an increase in the price of oil has upon the high-cost US shale oil producers.

AO4: Evaluation

Including accurate and relevant evaluation in your essay is the most important thing to ensure you achieve top marks. Evaluation is the art of making supported judgements, of deciding which factors are most important and providing a counterargument against some of the analytical points made in the essay.

There a huge number of evaluative angles you could take within this essay. Here we will showcase some useful examples. You would not be expected to include all of these examples – there simply is not enough time!

Lack of non-OPEC Commitment

- The production cut may not be effective in increasing the price of oil if non-OPEC producers do not voluntarily reduce their production as well. This is exacerbated as OPEC's market share has diminished and the ability and effectiveness of a production cut from OPEC to control supply and prices is no longer what it once was.

Time Frame

- The production cut in the short-run is likely to have the desired effects of reducing supply and increasing prices. But if prices increase significantly over and above the marginal cost of production for higher-cost firms it may encourage them back into the market to capture higher profits. Therefore, judgement about the success of the production cut is likely to depend upon which time-frame is being considered.

Elasticity of Demand Curve

- The significance of the production cut on the world price for oil will depend on the elasticity of the demand curve. The more inelastic the demand curve is, the more a supply curve shift will result in a large impact on the price of world oil. Traditionally the demand for oil has been very inelastic as it has very few close and direct substitutes available to consumers.

Alternative Sources of Energy

- One factor that could impact the elasticity of the demand curve for oil is the development of renewable energy sources as an alternative to oil. The development of this form of energy has gained traction in the last decade because of concentrated efforts by countries to reduce carbon emisions. Governments around the world have made subsidies available to firms that increase their energy efficiency. As this industry becomes more prominent it is expected that demand for oil will become more responsive to changes in prices. This ultimately will reduce the impact of a production cut.

Corruption

- Even if an agreement between OPEC producers has been made to control supply and stabilise the world oil market, if there is no effective enforcement of this agreement, in terms of punishment for cheating behaviour, then this agreement is likely to unravel. Many oil producing countries' budgets depend signficantly on oil revenues and the domestic pressures on firms to 'cheat' on agreements are high. This particular agreement is vulnerable to cheating behaviour as it is not legally binding.
- When we refer to cheating behaviour we are focusing on acts by firms within the agreement that break the rules of that agreement such as: undercutting rival firms, payment of bribes to increase quota allocation or concelaed actions to exceed a quota limit.

Oil Price settled at a new 'normal' level

- It could be argued that the price of oil has settled at a new lower level and oil prices may never consistently hit the high levels seen in 2014. This can be explained by the fact that, as a result of high supernormal profits in the industry being earned and the subsequent investment these profits incentivised, the industry has seen a high pace of innovation. This innovation has not only increased the world oil reserves which are obtainable by producers, but also made oil production more efficient, reducing costs.

Overall, it is important to provide in your essay, a reasoned judgement; an argument which makes a decision about whether the production cut will be effective in terms of raising the world price of oil. It doesn't matter which side of the argument you make the case for – you will be examined on how

effectively you structure that argument and how well you support it with economic theory.

The concluding paragraph of your essay is often a very good place to make clear what your overall reasoned judgement of the question is. Some people also like to include a similar judgement in their introduction, to signpost clearly to the examiner that they will be making an evaluative judgement in their essay.

Here is a good example of an attempt to argue that a production cut will lead to desired effects in the world oil market:

"Overall, if firms within the oil industry agree to stick to a production quota to restrict supply, it is likely to bring balance to the world oil market and stabilise prices. It is important to bear in mind that the production cut will require a concerted effort and commitment by all firms in the industry – OPEC and non-OPEC producers alike. However, if this quota can be effectively enforced within the market, it is likely to bring back higher prices for oil and higher supernormal profits to firms, as they take advantage of the inelastic demand curve for oil.

There is always a distinct possibility that higher prices may entice more firms to begin scaling up production and that can result in a greater supply of oil in the long-run. However, there is great uncertainty about the true productive capacity of new production techniques and therefore any future destabilising increase in supply, if it arises at all, is likely to be far away in the long-run. The short-term effectiveness of this policy cannot and should not be overlooked."

Alternatively, it would be just as valid to argue that the price cut may not be effective:

"On balance, a production cut by OPEC to stabilise the oil market is unlikely to be effective and successful. The short-run durability of the agreement may result in a slight temporary recovery in the oil price but the long-term allure of higher prices to high-cost shale producers will be too tempting to resist. In fact, with new techniques like fracking, already up and running, the 'long-run' may not actually be too far away. There is also a note of caution to emphasise regarding the short-run effectiveness of this policy. Many OPEC production agreements in the past have ended up being broken due to the incentive for

members to 'cheat' the cartel's agreement and unilaterally increase production."

Essays are marked on a levels basis. The overall quality of your essay will be considered when deciding upon which level the answer is.
Level 1 [1 – 5 Marks] – Very weak response which includes little relevant content.
Level 2 [6 – 10 Marks] – Weak response which shows some understanding but undeveloped analysis.
Level 3 [11 – 15 Marks] – Reasonable analysis but poor evaluation, which is usually unsupported.
Level 4 [16 – 20 Marks] – A well organised response with good analysis and some reasonable evaluation.
Level 5 [21 – 25 Marks] – A well organised response with good analysis and supported evaluation throughout and in a final conclusion.

Question 9:

Explain why firms in the pharmaceutical industry can charge different prices for the same drug in different countries.

[15 marks]

The key to answering this 15-mark question effectively is to realise that there are no marks available for evaluation. This question is focused upon examining your ability to present structured analysis, relying heavily upon well-written chains of reasoning. It is important to ensure that your response answers the question and provides a relevant and technically correct explanation.

Be careful to read the question carefully – here the question is demanding an explanation of why firms **can** charge different prices. This will need a focus upon the conditions which allow price discrimination to take place. An easy mistake to make would be to focus your answer on **why** firms would want to charge different prices, focusing on the benefits and incentive to do so. Whilst not completely irrelevant to the topic being discussed, this kind of response would not be effectively answering this specific question.

A good (but not the only) approach to this question is:

Step 1: Introduction

The introduction provides an opportunity to demonstrate that you understand what topic the question is asking about and structure your response. It is also a good opportunity to demonstrate some knowledge (AO1) by providing definitions of the key terms and some application (AO2) by making a clear link with the context.

The example below makes a clear reference to the context (pharmaceutical industry), provides an appropriate and applied definition (price discrimination) and sets up the rest of the answer by describing what we are trying analyse (different prices being charged to different consumers).

"The process of firms charging different prices to different segments of the market for an identical product, without cost differences, is an example of price discrimination. This is a commonly used pricing strategy within industries where firms have the ability to exert significant control over supply market and therefore can effectively separate the market into different consumer types,

based on their willingness and ability to pay. The pharmaceutical industry is an example of an industry where conditions are ripe for price discrimination to be implemented by firms effectively. There are several reasons for this, most importantly because the markets for pharmaceutical products in different countries are effectively segregated and different income levels ensure that consumers have different demand curves."

Step 2: Analysis

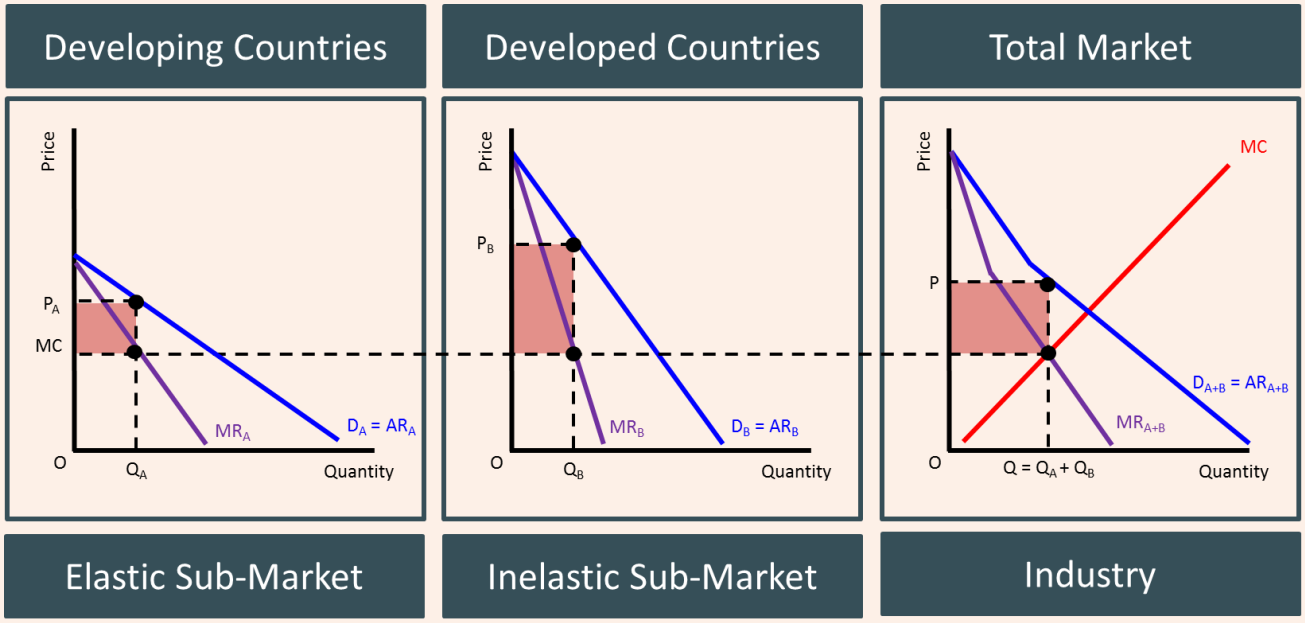
There are several forms of price discrimination. The form alluded to in this context is 3rd degree price discrimination. This is where firms charge different prices to different groups of consumers. In this example, consumers are grouped depending on the country in which they live.

To demonstrate relevant knowledge and application (AO1 & AO2) skills, beginning the heart of your response with a discussion of what form of price discrimination is being implemented would be useful. A good example is:

"Price discrimination can be implemented in three main forms. In the example of the pharmaceutical industry, it appears that it is third-degree price discrimination that is being utilised. This involves firms segregating consumers into different groups, based on their willingness and ability to pay, and charging these groups of consumer's different prices. Here, consumers are separated geographically with consumers living in developing countries being charged lower prices than those in developed countries."

This initial discussion of what form of price discrimination is being implemented would be well supported by a standard third-degree price discrimination diagram.

This is a complex diagram that involves drawing three separate diagrams – a diagram representing developing country consumers, a diagram representing developed country consumers and a diagram representing the combined market.



Use a ruler and ensure the diagram is neat and tidy.

A written explanation of the diagram would be useful. However, be careful not to fall into the bear-trap of spending too much time on this as it is easy to drift off into a discussion of the benefits to a firm of implementing price discrimination. The question is specifically asking about why firms **<u>can</u>** implement price discrimination, so it is important to bring the explanation of the diagram towards a discussion of the conditions needed for price discrimination to be feasible. A good example would be:

*"The diagrams represent pharmaceutical firms charging different prices **(P_A and P_B)** to consumers in developing and developed economies. In each sub-market, the firm sells a quantity **(Q_A and Q_B)** such that the marginal revenue in that sub-market equals the marginal cost of production. Thus, by doing so, the firm maximises their revenue (the red shaded areas) in each of the sub-markets and therefore generates more revenue than they would do should they charge only a single price across the entire worldwide market.*

The rationale for firms to engage in price discrimination is therefore clear, however implementing it relies upon some essential conditions."

This follows nicely into the core material which are the 3 key conditions required for price discrimination to take place. Each one needs to be explained using a clear chain of reasoning and applied to the context to demonstrate that the pharmaceutical industry adheres to it.

Different Demand Curves (Elasticity)

There must be groups of consumers who have different demand curves (distinguished by different price elasticities of demand) for the good. This allows the firm to maximise revenue in each sub-market by charging different prices.

Consumers in developing and developed countries are very likely to have different demand curves due to the differences in incomes for workers. Better paid workers in developed economies are likely to be more willing and able to pay for medical drugs at higher prices.

Firms able to identify sub-markets

Firms must be easily able to identify which group individual consumers belong to. This will allow them to know which price to charge those consumers.

In this context, the firms segment the market based on the consumer's geographical location. This provides the price discriminating firm with a simple pricing strategy to adopt as firms can change their prices according to the country in which the good is being sold.

Firms able to keep sub-markets separate

Firms must be able to prevent the cross-selling of products from consumers in different sub-markets. This ensures that a consumer in a developing country **(low priced drug)** cannot sell a pharmaceutical product to a consumer in a developed country **(high priced drug)** for a lower price than what is currently being charged in that developed country. If this alternative avenue is not effectively closed off by firms, then price discrimination will not have the desired benefits for the firm.

Within the pharmaceutical industry, there is a lot of government legislation which regulates the movement of medical drugs between countries. It would

be difficult, and sometimes outright illegal, to import drugs sold in a developing country into a developed country.

To guarantee maximum marks, your answer may need to expand a little further than the analysis thus far offered. There are a variety of relevant issues which can be analysed when looking at some of the conditions that make price discrimination a viable option in the context of the pharmaceutical industry. These include:

Transportation Costs

- In addition to the regulatory difficulties of importing and exporting drugs, many drugs require specialist expensive transportation. This provides an additional reason why the pharmaceutical industry is able to successfully keep the sub-markets separate.

Fairness (Equity)

- The use of government regulation to keep markets separate in the pharmaceutical industry might be intended to improve the fairness of access to medicine. By allowing price discrimination to take place, governments are (whether intentionally or not) allowing consumers in developing countries to access drugs at a more affordable price.

Imperfect Information

- Firms who believe that consumers have different demand curves may be more willing than it is feasible to engage in price discrimination. For example, firms may be underestimating the price consumers in developing countries are willing and able to pay and as a result may charge a price that is too low, reducing the effectiveness of price discrimination.

Product Diferentiation

- Differentiating products by using branding and promotional activities may allow firms to utilise price discrimination more effectively. It may be that the same drug is being sold in both developing and developed countries, but under different brands. The emphasis on branding in the developed countries leads to demand being greater in those countires, encouraging the implementation of price discrimination.

In your answer, you would not be expected to discuss more than one or two of these issues. This question does not examine your skills of evaluation, so you should focus upon using these issues briefly to push your analysis up to the top end! Your answer should take you no longer than 23 minutes. There is a lot of content you could potentially cover and therefore you should be aware that the priority is to effectively explain and apply the key conditions necessary for price discrimination to be implemented.

This question is marked on a levels basis. The overall quality of your response, including your diagram will be considered when deciding upon which level the answer is.
Level 1 [1 – 5 Marks] – Weak response which shows limited knowledge, application and unfocused analysis.
Level 2 [6 – 10 Marks] – Reasonable response that shows satisfactory knowledge and application with analysis which is reasonable but not fully coherent and/or fully developed.
Level 3 [11 – 15 Marks] – Organised and coherent response which demonstrates sound knowledge and application as well as strong analysis.

Question 10

Assess the view that price discrimination always leads to undesirable results for society.

[25 marks]

To access top marks in any economics essay, it is important to focus on two key elements:

As essay structure is a more general skill, we will focus on showcasing how to hit the different assessment objectives required for this specific question. However, hopefully the following discourse will provide some assistance with regards to essay structure.

AO1: Knowledge

Being able to display accurate knowledge is judged to be the most basic requirement in an essay. It is still important to be able to demonstrate accurate knowledge throughout your essay. You can signpost this by including accurate definitions. For example, in your introduction you might want to provide a definition of price discrimination – the main economic concept of the essay. This can be incorporated into your introductory paragraphs in the following way:

"Price discrimination is a complex pricing strategy adopted by firms, in which different prices are charged to different segments of the market for an identical product, in the absence of cost differences, to convert consumer surplus into higher revenue and profits for firms."

Introducing your essay by showcasing your knowledge and understanding of the subject matter will lay the foundations for your essay. In this section of the essay a detailed demonstration of your understanding of the key economic terms and concepts is required.

Other relevant definitions here MAY include defining the specific forms of price discrimination that firms can use to extract consumer surplus from the market:

- **First-Degree Price Discrimination - Each consumer charged that their maximum willingness to pay.**
- **Second-Degree Price Discrimination - Consumers charged different prices based on the quantities they consume.**
- **Third-Degree Price Discrimination - Consumers charged different prices based on their relative elasticity of demand (sensitivity to price changes)**

Be careful in your essay not to worry too much about spending significant time explaining the differences and divergences between the different forms of price discrimination. This essay focuses upon assessing the **results** of price discrimination, and qualitatively each form delivers the same results. You may, however, wish to use the distinction as an evaluative tool (see later on).

AO2: Application

Being able to apply your knowledge to the subject matter of the essay is particularly important in essay questions without a data extract, as it showcases to the examiner that you have a detailed and developed understanding of the related economic concepts in the essay. You are only expected to use some of these application examples in your essay:

Examples of Price Discrimination

- These examples should emphasise the main characteristics of price discrimination. This can either be in the context of the pharmaceutical industry or another context that you feel more comfortable with:
- Pharmeceutical firms can charge higher prices to developed countries than developing countries because of income differences between countries.
- Train companies charge different fares for peak and off-peak travel to reflect the fact that commuting to work at peak times is a necessity but travelling at off-peak times for leisure is more of a luxury.
- Children are often charged lower prices when visiting the cinema compared to adults, as children have less income to use to purchase tickets.
- Lawyers charge high net-worth clients more for their services compared to clients with a lower income.

New Dynamic Pricing Models

- Industries, like air travel, have pioneered the use of technology to extend their implementation of price discrimination. The price paid for an airplane ticket will often change hour by hour, in response to observed changes in demand.

Self-Selecting Price Discrimination

- A recent phenomenom is for firms to rely on consumers to self-select their price. They achieve this by offering lower prices, but only via a third-party deal which requires effort to track down and utilise. Consumers who value a good highly may be reluctant to expend any effort other than buying directly from the producer, at a higher price.

As ever, you only need to include some of these issues. Indeed, some of these application examples are quite high-level and would only be expected of highly sophisticated answers.

AO3: Analysis

The core of top-level essays consists of well-constructed, relevant analysis of the topic. This should be presented using logical chains of reasoning, and where appropriate, clear diagrams.

There are lots of analytical routes you could go down with a question like this. The core analysis will involve an explanation of the reasons and objectives of firms engaging in price discrimination and then via a set of diagrams the effects this pricing strategy has on society – both desirable and undesirable. A good (but not the only) approach would be to consider the impact of firms engaging in a specific form of price discrimination such as third-degree price discrimination (other forms of price discrimination could also be used). The analysis provided by the diagrams can put forward the intuitive reasons why firms wish to engage in price discrimination and the net effect that this has on them and other economic agents.

The Objective of Price Discrimination

The question is prompting a response to cover the consequences for both consumers and firms. We will examine the consumer effects later in the analysis section once the diagrams have been introduced. Our focus initially is on the effects of price discrimination on firms.

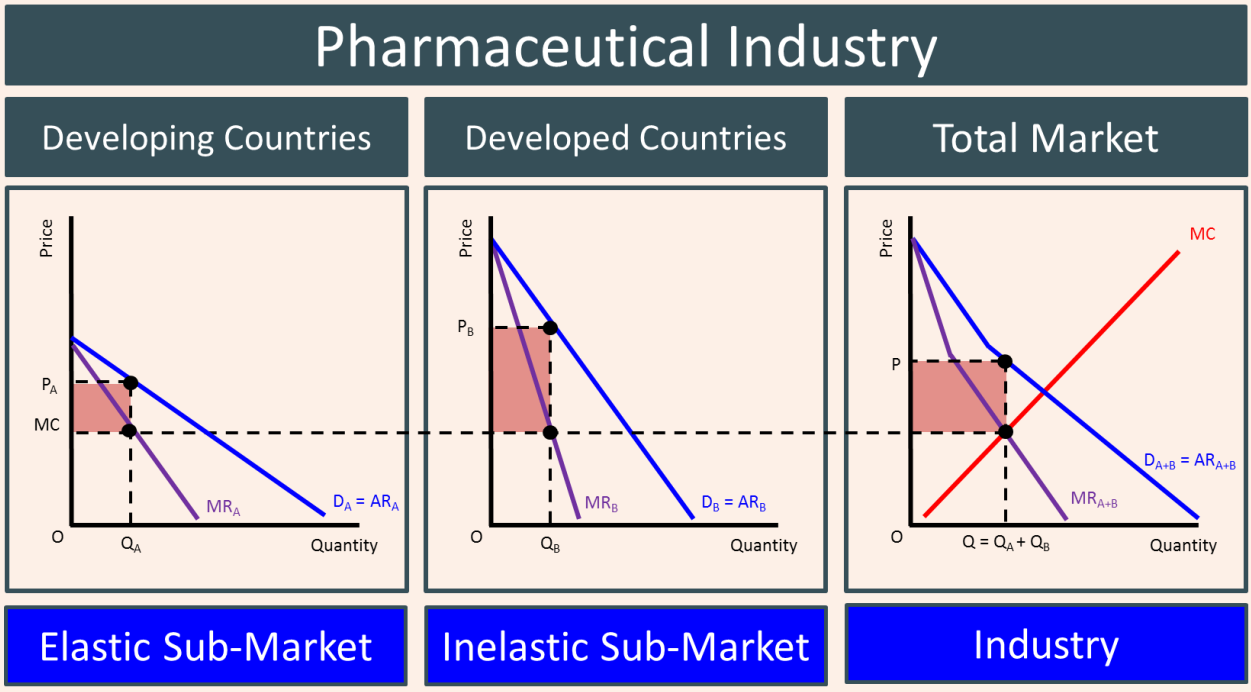
"Profit-maximising firms have an incentive to charge consumers different prices based on their willingness and ability to pay for products as it helps maximise sales revenue if the conditions for price discrimination are satisfied. Higher revenue, with no accompanying impact on costs, will result in the firm enjoying larger profits. This, in turn, represents an increase in producer surplus."

The chain of reasoning would be very well-supported by a series of diagrams which show how any form of price discrimination can help firms convert consumer surplus into producer surplus. As there are different forms of price discrimination it is important to make sure you use the correct diagram that reflects that pricing strategy.

Third-Degree Price Discrimination

The most effective diagram to highlight the impact of price discrimination on the market is third-degree price discrimination – which involves firms splitting the market into segments to charge consumers different prices to maximise profits.

The diagram shows how pharmaceutical firms have identified two different sub-markets to sell their products to - developing countries and developed countries. The market segments have been classified based on their marginal willingness to pay for the product i.e. the elasticity of demand. The distinction between the two is represented by the different price elasticities for the drugs in each sub-market. Developing countries face a more elastic demand curve for drugs, reflecting the low income levels within those countries (lower willingness and ability to pay), whilst developed countries face a relatively inelastic demand curve because of the high income levels in those countries (higher willingness to pay).



When the market is separated, the price and output in developing countries is at P_A and Q_A, higher output but at a lower price. Whereas, in developed countries, because of the inelastic demand curve, the price will be higher at P_B and the quantity sold is slightly lower at Q_B. As the firm is catering for two

different sub-markets, the marginal revenue curve and demand curve the firm faces will be kinked. This reflects the fact that the firm cannot charge the higher inelastic price to consumers in developing countries as there is no demand for the product at that price. Therefore, at any price at or above P_B the firm faces an inelastic demand curve, whilst any price below P_B the firm faces an elastic demand curve to satisfy the demand for crucial medicines in poverty stricken and health deprived areas within developing countries.

The prices are set in each sub-market for the firm to maximise profits. Profit maximisation for the firm will occur when MC=MR. This point leads to the number of drugs being sold to the UK and US to be Q (= Q_{UK} + Q_{US}).

The marginal cost of producing goods is transferred to each market segment as the marginal cost of producing the drug is the same regardless of the location sold. This means that the total profits made through this pricing strategy is represented by the sum of the red shaded areas in the sub-market diagrams.

As the profit from separating the market into segments is greater than setting a uniform price across countries, it is optimal for the pharmaceutical firm to consider a more complex pricing strategy within the market

The firm is neither productively efficient, as it does not produce at the minimum point of the AC curve, nor is it allocatively efficient as the prices charged for consumers does not equate the marginal cost of production.

As the question, does not explicitly refer to a specific form of price discrimination, other relevant price discrimination diagrams are possible to highlight the market outcome of price discrimination. The general results hold for any form of price discrimination.

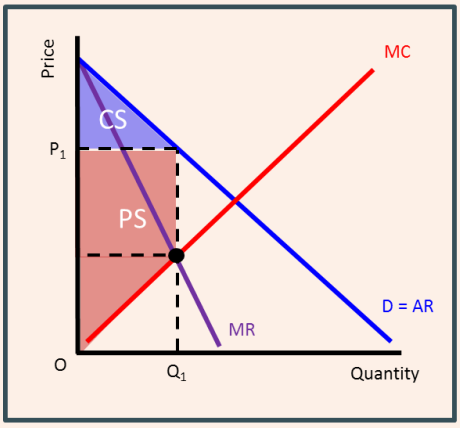
First-Degree Price Discrimination:

A form of price discrimination in which all consumers are charged their maximum willingness to pay for the good and therefore each unit of output is sold at a different price so that all the consumer surplus in the market is captured by firms and converted into producer surplus.

This form of price discrimination perfectly segregates the market into individual consumers rather than broader sub-markets under third-degree price discrimination. This is done by charging each consumer the price that they are willing to and able to pay.

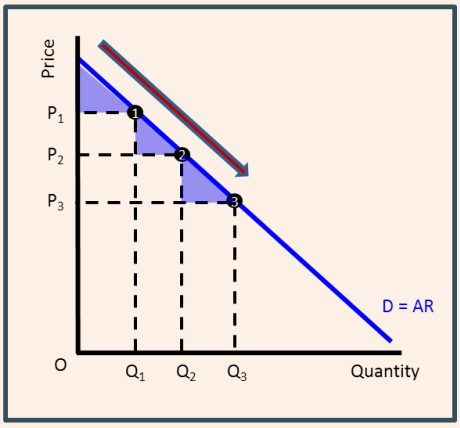
First-Degree Price Discrimination

Original Equilibrium



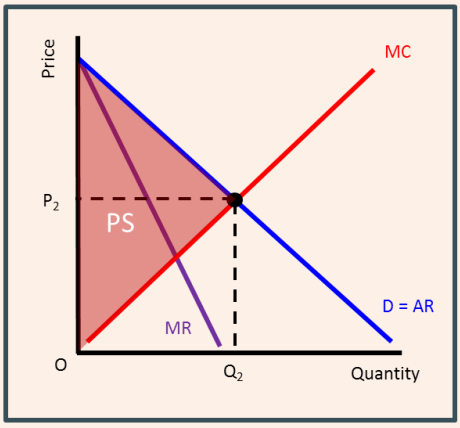
Normal profit maximising price and output is P_1 and Q_1. Unclaimed consumer surplus

Price Discrimination



Segregating market into individual consumers and charging a price equal to their marginal willingness to pay →captures remaining consumer surplus.

New Equilibrium



All of the consumer surplus has been captured and converted into producer surplus.

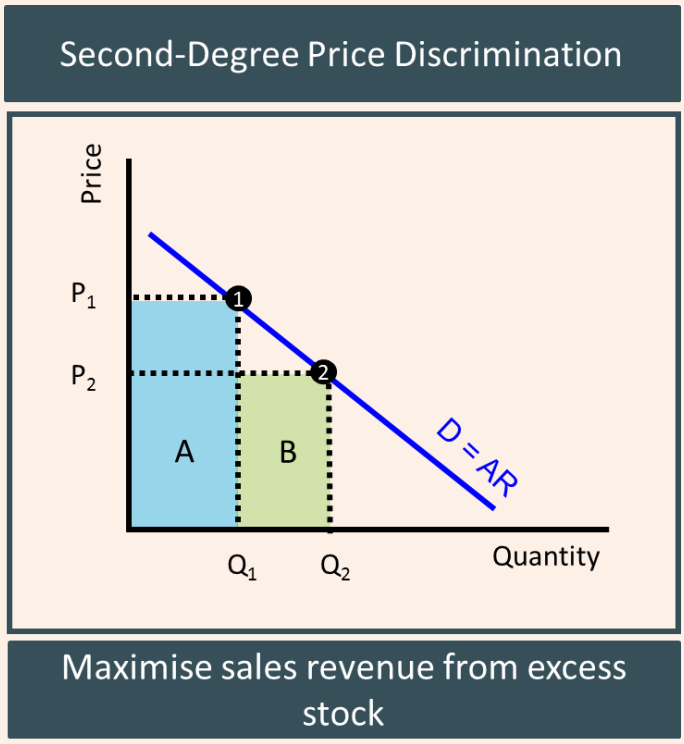
Price discrimination means more goods are sold in total; but unlike under a normal demand curve firms have not had to decrease the price for all consumers as they have been able to perfectly segregate the market based on the willingness to pay.

This pricing strategy is occasionally referred to as 'optimal pricing' as all firms would like to adopt this pricing strategy, because it extracts the entire consumer surplus under the demand curve and convert this into extra revenue for the firm. However, this form of price discrimination requires detailed knowledge about the preferences of each individual consumer, which is almost impossible for any firm in the real world to obtain.

Second-Degree Price Discrimination:

A form of price discrimination in which consumers are charged a different price based on the quantity of goods that are consumed. This is a pricing strategy used by firms to sell off excess capacity of stock that they hold in their inventories.

The strategy works by firms charging a higher price for small quantities of the product, but a lower price is introduced when the consumer purchases a higher quantity of the product, as this extra quantity represents additional units consumed which are of less value and importance to consumers purchasing.



This form of pricing strategy increases sales revenue by the shaded green region (B). It could be argued that this is a pricing strategy used by the pharmaceutical industry as certain firms may charge lower prices when products are bought in bulk by organisations like the NHS, compared to small quantity purchases.

Effects of Price Discrimination

The diagrams allow you to effectively highlight the benefits of price discrimination to firms. Bear in mind there will be subtle differences between the advantages and disadvantages of price discrimination on economic agents depending on which degree of price discrimination you focused on in the

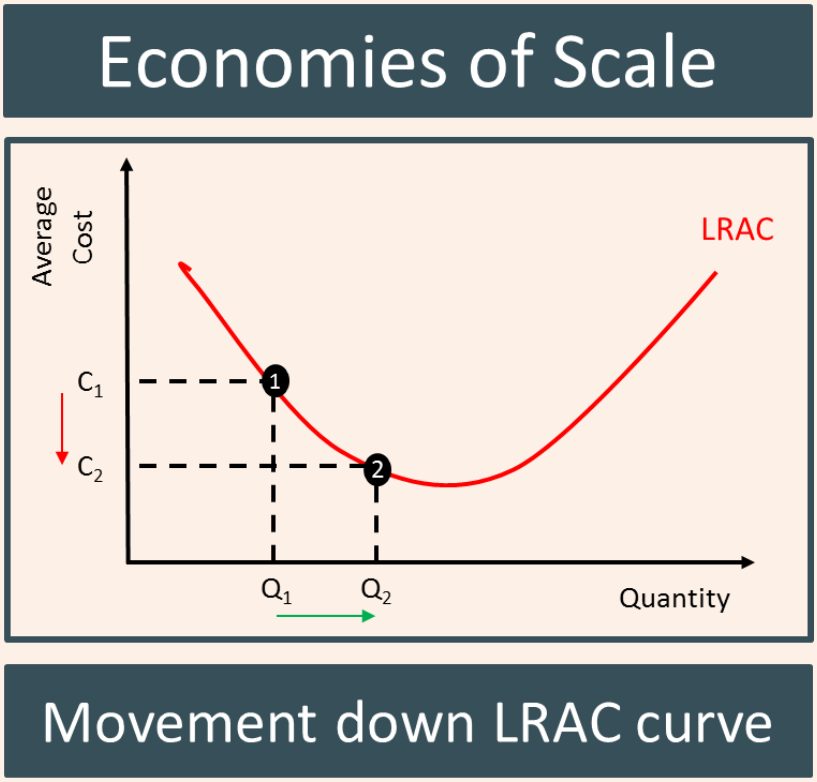
analysis section, but the basic principle of each advantage and disadvantage will still be relevant.

Higher Profits

- By using price discrimination, firms can increase their overall level of profits (the extent of this depends on the degree of price discrimination used). This is achieved by converting consumer surplus into producer surplus by raising prices for consumers who value the good the most) and encouraging consumers who value the good the least to purchase the product by advertising an enticing price. The combination of more products being sold in the elastic market and a higher margin established in the inelastic market means that overall revenue and profits are higher than under a single uniform pricing strategy.

Economies of Scale

- If sales are higher under price discrimination than under a single price, it means that the producer will have to produce more of the product. When the output of a firm increases this may move them further down the LR average cost curve and generate economies of scale for the firm. This will improve the firm's profit margins.



Low Margin Products Survive

- By being able to set different prices for different consumers it allows the firm to be able to maintain products that under a uniform pricing strategy would not survive. This strategy may help turn a loss-making product into a profitable one and therefore increase the range of products available on the market compared to a market where firms adopt uniform prices.

Reduces Fixed Costs

- As the law of demand states that there is an inverse relationship between price and quantity demanded, price discrimination can be used to help evenly spread demand between different market segments to improve capital utilisation and keep fixed costs low. This is the logic used in peak and off-peak rail ticket pricing.

This question is asking you to consider the impact of price discrimination by firms on society - consumers and firms. Therefore, the essay needs to refer to how price discrimination affects certain consumers in the market.

Affordability of Products

- Price discrimination can result in some products becoming more affordable to certain groups of consumers than under a uniform pricing strategy. Those who value the good below the original price may now be able to consume at the lower price made available through price discrimination to them.

Loss of Consumer Surplus

- Price discrimination forces some consumers to pay higher prices for certain goods and services compared to under a uniform pricing strategy which reduces the overall level of consumer surplus in that market (in the case of first-degree price discrimination all consumers surplus is eliminated and converted into producer surplus).
- The reduction in consumer surplus reflects the fact, all other things being equal, that consumers will have less income at their disposal if they continue to purchase the same goods. If consumers have less income to spend as a result of spending more on higher priced products, it means that other markets will be impacted as well (interrelatonships of markets). This creates a further elimination of consumer surplus in other markets.

Distribution of Income

- Lessens the effect of income inequality within a society as the people on the highest incomes are paying the highest prices and vice versa.

AO4: Evaluation

Including accurate and relevant evaluation in your essay is the most important thing to ensure you achieve top marks. Evaluation is the art of making supported judgements, of deciding which factors are most important and of explaining in the circumstances in which factors assume importance or otherwise.

There are a huge number of evaluative angles you could take within this essay. Here we will showcase some useful examples. You would not be expected to include all of these examples – there simply is not enough time!

It is particularly crucial in this type of essay question as you need to evaluate whether price discrimination 'always' creates undesirable results for society. Critiquing this element of the question phrasing is a sure-fire way to demonstrate some good evaluation skills.

Lessening of Competition

- Price discrimination may benefit incumbent firms (existing market players) but the low prices set in elastic markets may force competitiors out of the market and deter new firms from entering. Firms can set extremely low prices in elastic markets, as they can use the profit earned on high margins within inelastic markets to cancel out any losses made from low prices, granting them the opportunity to undercut their rival firms in the elastic market. The low prices also act as a barrier to entry, as new firms realise the profit potential is not very high within elastic markets. This reduces competition in the long-run and can create efficiency problems for the market.

Missing Information

- It is assumed that firms know the shape and location of their cost and demand curves, which then allows them to decide upon the profit-maximising price and quantity to reach their desired objective. However, in the real world firms will not always be aware of the exact shape of their costs and revenue curves which limits the effectiveness of price discrimination and therefore the theoretical benefits of price discrimination for economic agents may not be fully realised.

Social Discrimination

- There may be instances where price discrimination does not yield the expected benefits to the market that is theorised because of the fact that price discrimination within an industry may reflect social discriminaton, where different groups in society are discriminated against through higher prices i.e. individuals may be paying higher drug prices based on their gender.

Government Intervention

- The extent to which price discrimination would deliver the theorised benefits to producers and consumers depends upon the extent and nature of government intervention in the market. If, for example, the government was going to intervene and prevent some pharmaceutical firms from charging higher prices in certain market segments by setting a maximum price, then this will reduce the effectiveness of price discrimination converting consumer surplus into producer surplus.

Market Structure

- Price discrimination involves market segmentation and firms setting their own prices which can only occur in markets where firms have significant market power. But if the firm is not a monopolist and there is interdepency in the market, then the firm will need to gauge the reaction of other rival firms in the market and therefore price discrimination may not be feasible or the effects may be limited in magnitude.

Dynamic Efficiency Benefits

- If price discrimination creates the conditions for firms with signficant market power to increase the amount of supernormal profits they can earn in the market, it raises the possibility that those firms in a protected and elevated position in the market may reinvest those supernormal profits back into costly reserach and development projects. This may create dynamic efficiency benefits for the market, by increasing the pace of innovation, invention and technological progress within the industry over time. This is a particularly important factor to consider in the context of the pharmeceutical industry as the cost of developing new and improved drugs is extremely high. If the pace of innovation and invention within the pharmeceutical industry increases then this could lead to exploration of new products to help combat disease, providing positive externalities for society.

The nature of the price discrimination

- First-degree price discrimination will cause greater magnitude effects upon the market than second or third-degree price discrimination would.

Is it really Price Discrimination?

- What looks like price discrimination may simply reflect actual cost differences. A societal paranoia of firms engaging in price discrimination may lead to misdiagonosis and negatively affect firms' attitudes towards pricing strategies.

Overall, it is important to provide in your essay, a reasoned judgement; an argument which makes a decision about whether firms engaging in price discrimination within an industry is likely to always create undesirable results. It doesn't matter which side of the argument you make the case for – you will be examined on how effectively you structure that argument and how well you support it with economic theory.

The concluding paragraph of your essay is often a very good place to make clear what your overall reasoned judgement of the question is. Some people also like to include a similar judgement in their introduction, to signpost clearly to the examiner that they will be making an evaluative judgement in their essay.

Here is a good example of an attempt to, in one paragraph, argue that price discrimination does not always lead to undesirable results for society:

"In conclusion, the effects of price discrimination on consumers and producers can be both advantageous and disadvantageous. Whilst the most obvious impact of price discrimination is the transfer of consumer surplus into producer surplus, it is important to remember that this is simply a transfer from one group in society to another. In addition, less tangible benefits like price discrimination's ability to allow a market to provide greater product choice and the potential dynamic efficiency benefits sway the argument away from deciding that price discrimination is always undesirable for society."

Essays are marked on a levels basis. The overall quality of your essay will be considered when deciding upon which level the answer is.
Level 1 [1 – 5 Marks] – Very weak response which includes little relevant content.
Level 2 [6 – 10 Marks] – Weak response which shows some understanding but undeveloped analysis.
Level 3 [11 – 15 Marks] – Reasonable analysis but poor evaluation, which is usually unsupported.
Level 4 [16 – 20 Marks] – A well organised response with good analysis and some reasonable evaluation.
Level 5 [21 – 25 Marks] – A well organised response with good analysis and supported evaluation throughout and in a final conclusion.

Question 11

Using economic theory, explain why pay differentials exist between such professions. **[15 marks]**

The key to answering this 15-mark question effectively is to realise that there are no marks available for evaluation. This question is focused upon examining your ability to present structured analysis, relying heavily upon well-written chains of reasoning. It is important to ensure that your response, answers the question and provides a relevant and technically correct explanation.

Be careful to read the question carefully – here the question is demanding an explanation of **why** pay differentials exist. This will need a focus upon the economic fundamentals which result in different wage levels being paid. An easy mistake to make would be to focus your answer on whether these pay differentials are fair (equitable) or what can be done to reduce them. Whilst not completely irrelevant to the topic being discussed, this kind of response would not be effectively answering this specific question.

A good (but not the only) approach to this question is:

Step 1: Introduction

The introduction provides an opportunity to demonstrate that you understand what topic the question is asking about and structure your response. It is also a good opportunity to demonstrate some knowledge (AO1) by providing definitions of the key terms and some application (AO2) by making a clear link with the context.

Despite not being explicitly mentioned, the question focuses upon labour market equilibria within the context of comparing the wage rate paid to elite footballers and nurses:

The example below makes a clear reference to the context provides an appropriate and applied definition (pay differentials) and sets up the rest of the answer by describing what we are trying analyse (why different wage rates are paid to different types of workers).

"Pay differentials describe the different wage rates received by different types of workers. The fact that elite footballers, who are perceived to have a relatively fortunate and 'easy' lifestyle are often paid millions of pounds a year whilst nurses, who spend their time tending to the vulnerable and ill, are paid around or less than the median UK salary, is seen by many to be inequitable. The fact is, however, that in the absence of significant market frictions or government interventions, wage rates for different professions are decided by labour market equilibria, which rely upon the fundamentals of labour demand and supply."

Step 2: Analysis

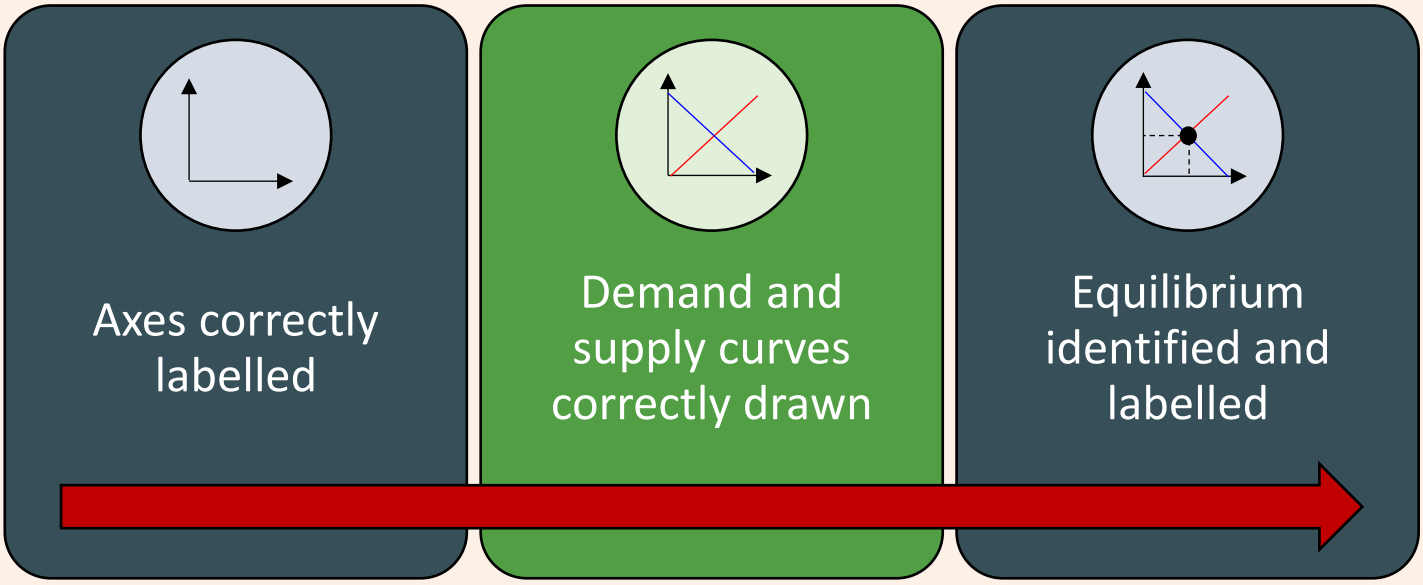
Having already alluded to the importance of equilibrium in the labour market, the opportunity is available to plough ahead and explain that the market for labour within a particular industry can be modelled like every other industry: with the fundamentals of demand and supply.

To further demonstrate relevant knowledge and application (AO1 & AO2) skills, beginning the heart of your response with a discussion of the key factors that the demand and supply of labour each depend upon would be a strong start. A good example is:

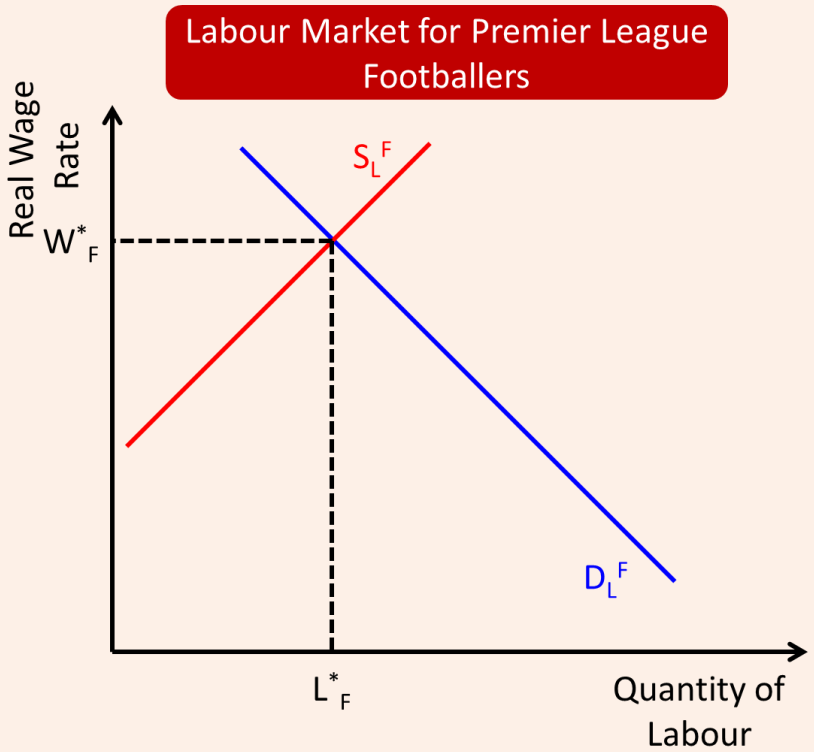
"Labour markets for an individual profession can be examined with the help of demand and supply analysis. The demand for labour represents the value that firms place on employing workers within that industry. More technically, the wage rate a firm is willing to pay a worker will be equal to the marginal revenue product of that worker - the value of the output each worker produces. The supply of labour represents the wage rate workers would have to receive to be willing to accept a job in that industry. The level of labour supply in a particular industry depends on a number of factors, including the available pool of people who have the necessary skills and ability to perform the role and how enjoyable and fulfilling the role will be to perform."

This initial discussion leads nicely on to applying labour market equilibrium theory to the specific example being considered with the assistance of demand/supply diagrams. You might consider introducing two diagrams, one for each of the professions.

In each case, for the diagrams to be completed accurately, the following features must be present:



Use a ruler and ensure the diagrams are neat and tidy.



Here the labour market diagram for elite footballers has been drawn with a demand curve out to the right (representing a large demand) and a supply curve out to the left (representing a low supply). The labour market

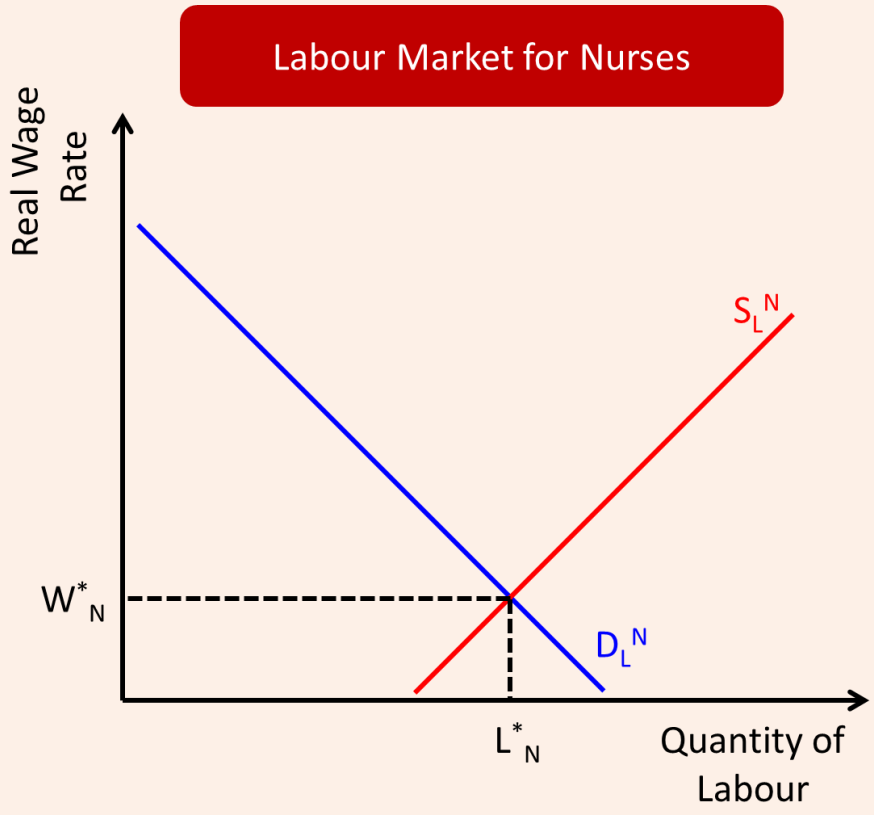
equilibrium is formed at a high wage rate of W^*. An explanation for why the diagram is depicted like this is essential. A good example would be:

"The high wage rate paid to elite footballers is the result of both demand and supply factors. The supply and diagram represents the demand for labour being high, with the demand curve (D_L^F) out to the right of the diagram. This is the result of the marginal revenue product of a footballer potentially being extremely high because of the commercial value of that player to the football club. The eye-watering sums on offer for success in competitions like the Premier League, makes the services of a high-quality player who might ensure a club wins a trophy or avoids an expensive relegation highly valuable.

The diagram also represents the supply of labour as low, with the supply curve (S_L^F) out to the left of the diagram. This is primarily due to the small pool of the overall workforce who have the sufficient ability to successfully play elite football.

The combination of a high marginal product and limited supply leads to a high equilibrium wage rate of W^*."

This follows nicely into introducing the demand and supply diagram for the labour market for nurses.



Here the demand curve has been drawn further in (to the left) than for the footballers diagram and the supply curve has been drawn a lot further out (to the right). A good explanation of why the diagram has been drawn like this would be:

"The relatively lower wage rate paid to nurses in the UK is again the result of both demand and supply factors. The demand for the labour of nurses, whilst not low due to the nursing requirements of organisations like the NHS, is less as nurses provide a lower marginal revenue product than elite footballers. To reflect this, the demand for labour curve (D_L^N) has been drawn slightly further inwards.

Even more importantly, the supply of labour is vastly larger than previously. The pool of the overall workforce who have the skill and ability to effectively fill nursing roles is significantly larger than that able to play top-level football. As a result, the supply of labour curve (S_L^N) has been drawn further outwards (to the right).

These demand and supply conditions result in a labour market equilibrium where nurses are paid a far lower real wage rate (W^*_N)"

To guarantee maximum marks, your answer may need to expand a little further than the analysis thus far offered. There are a variety of relevant issues which can be analysed when explaining why pay differentials exist. Some of these revolve apply to other examples and specifically to the nurses and footballers example we have principally focused on. These include:

Non-Monetary Factors

- The supply of labour often differs between industries due to the different levels of appeal each role has. Roles which are more enjoyable to perform are likely to encourage a higher supply of labour which will result in a lower equilibrium real wage rate.

Alternative Employment

- The level of the supply of labour for a given industry is partially dependent upon the other employment options that are available to prospective workers. In industries where workers have appealing and readily available substitute work, the supply of labour is likely to be lower resulting in a higher equilibrium real wage rate.

This question does not examine your skills of evaluation, so you should focus upon using these issues briefly to push your analysis up to the top end! Your answer should take you no longer than 23 minutes. There is a lot of content you could potentially cover and therefore you should be aware that the priority is to effectively explain why different labour markets have different equilibrium real wage rates.

This question is marked on a levels basis. The overall quality of your response, including your diagram will be considered when deciding upon which level the answer is.
Level 1 [1 – 5 Marks] – Weak response which shows limited knowledge, application and unfocused analysis.
Level 2 [6 – 10 Marks] – Reasonable response that shows satisfactory knowledge and application with analysis which is reasonable but not fully coherent and/or fully developed.
Level 3 [11 – 15 Marks] – Organised and coherent response which demonstrates sound knowledge and application as well as strong analysis.

Question 12

Assess the case for government intervention in labour markets to improve pay differentials and achieve a fairer distribution of income.

[25 marks]

To access top marks in any economics essay, it is important to focus on two key elements:

As essay structure is a more general skill, we will focus on showcasing how to hit the different assessment objectives required for this specific question. However, hopefully the following discourse will provide some assistance with regards to essay structure.

AO1: Knowledge

Being able to display accurate knowledge is judged to be the most basic requirement. It is still important to be able to demonstrate accurate knowledge throughout your essay. You can signpost this by including accurate definitions. For example, in your introduction you might want to provide a definition of the distribution of income. For example:

"The distribution of income is a key economic indicator of equality as it represents the extent to which workers receive different wage rates and salaries throughout an economy."

AO2: Application

Being able to apply your knowledge to the relevant context is particularly important when writing an essay. In this case, there are lots of avenues for you to make a contextual reference to the UK (and other economies) and specific

examples of pay differentials and government intervention in the labour market. Some of these include:

The National Minimum Wage

- The UK introduced its minimum wage in 1999. Currently, the minimum wage has been re-branded for those aged 25 and above and is called the 'National Living Wage'. The National Living Wage is currently being increased significantly each year.

UK Inequality

- The UK's inequality levels, as measured by statstics like the Gini coefficient, are higher than those of most European countries, but lower than some other developed economies, like the USA. More attention has been brought to bear on the topic of the distribution of income in the wake of stagnent real wages for most of the distribution following the 2008 financial crisis.

Fat Cat Wednesday

- Increased focus has been applied to the incomes of the very rich in society. In 2017, 'Fat Cat Wednesday' was widely publicised to highlight that by Jan 4th the average FTSE 100 CEO had made the same amount of income as the average UK employee's average salary.

High-Level Taxation

- In 2013, the highest taxation rate in the UK was reduced from 50% to 45% on earnings over £150,000. Critics argue that this has exacerbated income inequality, whilst supporters claim that reducing the taxation rate has in fact resulted in the government raising more revenue than before.
- There has been a lot of focus upon the utilisation of dubious tax avoidance schemes by some of the richest individuals in the UK. Critics suggest that the government should do more to stop such schemes being abused.

Low-Level Taxation and Benefits

- The income threshold below which individuals pay no tax has been steadily increased over the previous few years. This amounts to an effective cut in the amount of tax paid by the lowest earners in society.
- Alongside this, benefit payments have been squeezed as a consequence of the emphasis upon economic austerity.

As ever, you only need to include some of these issues. Indeed, some of these specific application examples require extensive knowledge of the current UK economy and would only be expected of highly sophisticated answers. The general trends, however, would be useful components of mid-level responses.

AO3: Analysis

The core of top-level essays consists of well-constructed, relevant analysis of the topic. This should be presented using logical chains of reasoning, and where appropriate, clear diagrams.

There are lots of analytical routes you could go down with a question like this. The heart of the analysis will discuss some possible government interventions in the labour market and their likely effects upon pay differentials and the distribution of income. One (of many) possible structure of the analysis is to begin by explaining why an unequal distribution of income is potentially a problem, then detail some of the possible government interventions and their likely impacts.

Inequality

Where an economy is subject to inequalities in the distribution of income and wealth, there are two main arguments why society might view this as a negative phenomenon and want the government to intervene.

The first is a consideration of the fairness of pay differentials. This relates the concept of inequality to the concept of inequity (unfairness). Whilst a contentious view, there are many who believe that severe pay differentials are inherently unfair and for honest labour, the divergences in wages should be reduced. Much economic thinking assumes that the government is interested in the overall welfare of society as a whole (the sum of all individuals), in which case there is an argument to be made that if the government can intervene to reduce income inequality and inequity then they will have a positive effect upon society's overall welfare.

The second is to consider pay differentials as a source of market failure. This is especially the case if those at the bottom end of the distribution of income are pushed into poverty. The argument is that the market is failing to provide a

sufficient labour income for workers to be fully functioning members of society. Low incomes may prevent them from being able to afford an effective education or from being to search for jobs effectively. Consider being unable to apply for a job because you couldn't afford a suit for the interview. Explaining the potential costs of inequality explains why we might consider possible government interventions later in the analysis. For example:

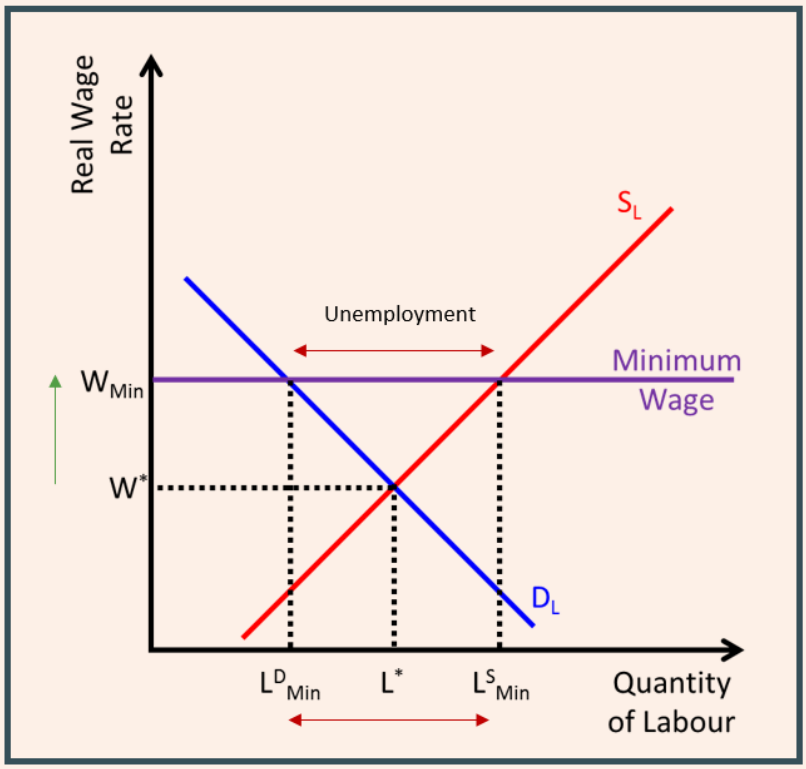
"Pay differentials and the unequal distribution of income that results are arguably very damaging to the overall welfare of society. The concept of the equity of different wage rates has been a long-discussed topic in economies around the world. Socialists have often argued that wide pay differentials are simply unfair and that governments should implement policies to increase the fairness of labour markets. Furthermore, many argue that an unequal distribution of income is an example of market failure, as it can impose costs upon society. The inability of those subject to poverty to engage in essential consumption decisions may restrict their ability to effectively participate and progress in the workforce."

Once the rationale for examining government intervention has been established, the essay can move on to specific examples of possible government interventions. In each case, it is essential that the form of the proposed intervention is clearly explained and that there is a good chain of reasoning which details its likely effect upon pay differentials and the distribution of income.

There are lots of possible examples that could be used. There is simply not enough time to attempt to detail every one of them. You should focus on two or maybe three of what you consider to be the most important or illuminating examples. Possible examples include:

Introduce / Increase the Minimum Wage

A minimum wage essentially operates as a minimum price within the labour market. It prevents firms from paying below a certain threshold as a wage to their workers. It can have a potentially large impact upon the wages earned in low-paying industries. The effects are best analysed with the assistance of a diagram:



It is essential that the diagram is followed by a clear explanation of what the diagram is depicting. For example:

"The diagram showcases the impact that a minimum wage would have upon a low-paying labour market. This labour market is at an initial equilibrium formed by the intersection of the supply of labour (S_L) and demand for labour (D_L) curves, where L^* workers are employed at a real wage rate of W^*. The introduction of the minimum wage (W_{Min}) at a higher real wage rate than the initial equilibrium (W^*) moves the market out of equilibrium.

The upshot of this is that workers who remain employed within the industry receive an increased real wage rate. Increasing the wages of these low-paid workers is likely to, in isolation, make the distribution of income more equal.

However, as firms are now forced to pay each worker the minimum wage, they demand fewer workers (L^D_{Min}). This in contrast to the impact upon the supply of labour. The higher wage being offered encourages more people to be willing to take up roles in the industry. The disequilibrium, therefore, results in classical unemployment to the extent of $L^S_{Min} - L^D_{Min}$."

Further analysis of this potential intervention might include the following:

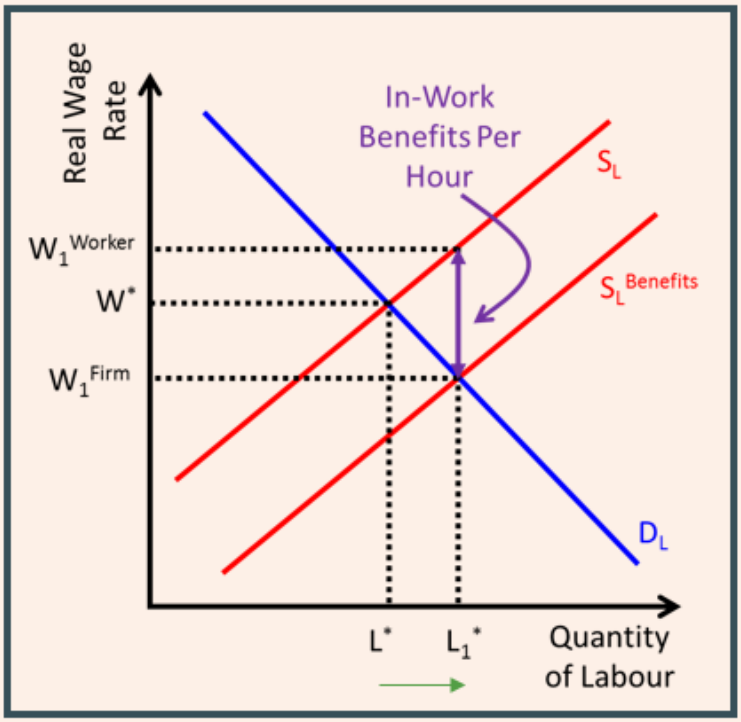
Impact of increased unemployment upon the distribution of income

The impact upon firms and their profits of paying a higher wage rate

The increase in unemployment increasing the costs of benefits provision.

Providing / Increasing In-Work Benefits

Providing additional financial support to workers who receive low wages is a common intervention undertaken by many world economies. It is analogous with the government providing a subsidy for the employment of labour. Again, this can be most effectively analysed with the assistance of a diagram. However, note that this diagram is a little more complicated than some of the standard labour market diagrams and you may not have encountered it before in your studies. Analysing this intervention without the use of the diagram would be acceptable if written clearly.



The accompanying explanation could be:

"The diagram showcases the effect of the government intervening in low-paying labour markets by providing in-work benefits, like the UK government's policy of tax credits. This is modelled as a subsidy for labour, paid to the supplier (the workers).

The diagram shows the effect of this subsidy is to shift the supply of labour curve outwards from S_L to $S_L^{Benefits}$. The incidence of the subsidy is split between workers and firms, with the real wage rate paid by firms falling from W^* to W_1^{Firm}, but importantly with the effective real wage rate paid to workers

increasing from W^* to W_1^{Worker}. The in-work benefits paid by the government to the workers therefore outweighs the reduction in the wage rate paid by firms.

This increase in the real wage rate received by workers in low-paying jobs is likely to decrease the inequality of the distribution of income. Another helpful effect is that the provision of in-work benefits encourages an increase in the quantity labour employed in these industries, from L^* to L^*_1, potentially resulting in a fall in unemployment. As the unemployed are prime candidates to be at the very bottom of the distribution of income, this is likely to also improve inequality."

Further analysis of this potential intervention might include the following:

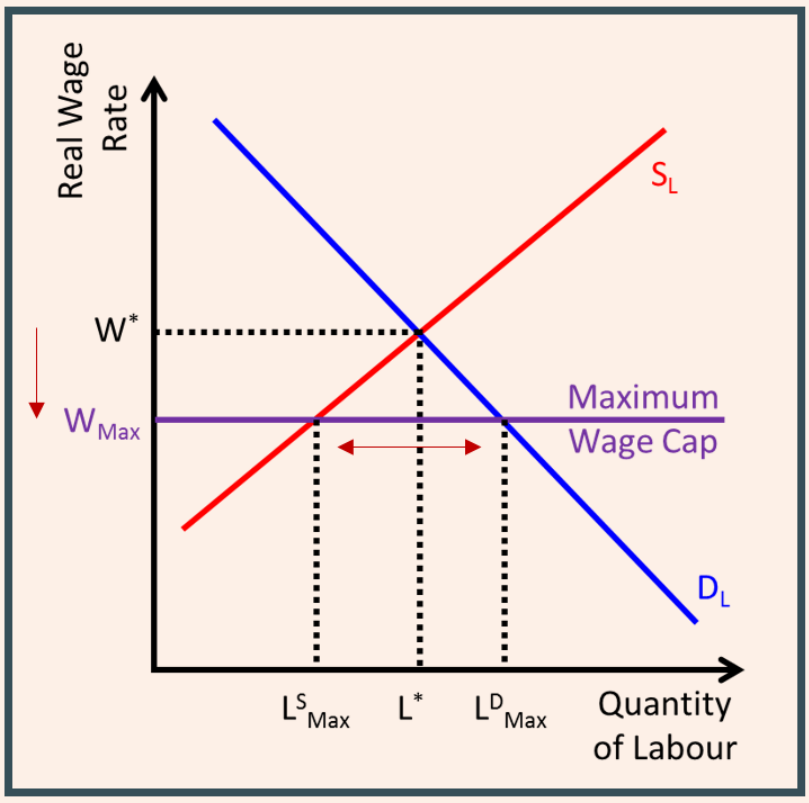
- The cost of providing the in-work benefits to the government
- How would the benefits be structured?
- The equity of subsidising firms to pay lower wage rates
- The distortion to firm's incentive to invest in capital due to lower wage rate
- The potential effect of the backwards-bending individual labour supply curve

The two interventions considered so far have both been aimed at lifting the incomes of those at the bottom of the distribution of income. The next possible intervention looks at the dragging down the incomes of those situated at the very top of the distribution.

Maximum Wage Cap

A maximum wage cap would operate as a maximum price within the labour market. In practice, it might manifest itself as a 100% (or close to) marginal taxation rate above a certain threshold. This policy is not unheard of – during the second world war, the highest marginal taxation rate in the UK was 99.25%.

A diagram of a high-paying labour market (perhaps the market for CEOs) with a maximum wage is, unsurprisingly, helpful to illustrate this analytical thread:



The explanation to accompany the diagram might resemble this:

"In high-paying labour markets, a maximum wage cap which is set below the initial equilibrium real wage rate (W^*) will influence the market by pushing it into a state of disequilibrium. Here a wage cap of W_{Max} has caused the demand for labour (L^D_{Max}) to be higher than the supply of labour (L^S_{Max}), resulting in classical unemployment. By reducing the number of those employed in a high-paying industry, the distribution of income is favourably affected.

Indeed, for those who do remain employed at the new real wage rate of W_{Max}, they do indeed receive a lower real wage rate than previous, which will also help to make the distribution of income more equal.

Whether, however, reducing the number of the highest-paid, and therefore potentially the most productive, workers in employment is worth the reduction in pay differentials is an important consideration."

Further analysis of this potential intervention might include the following:

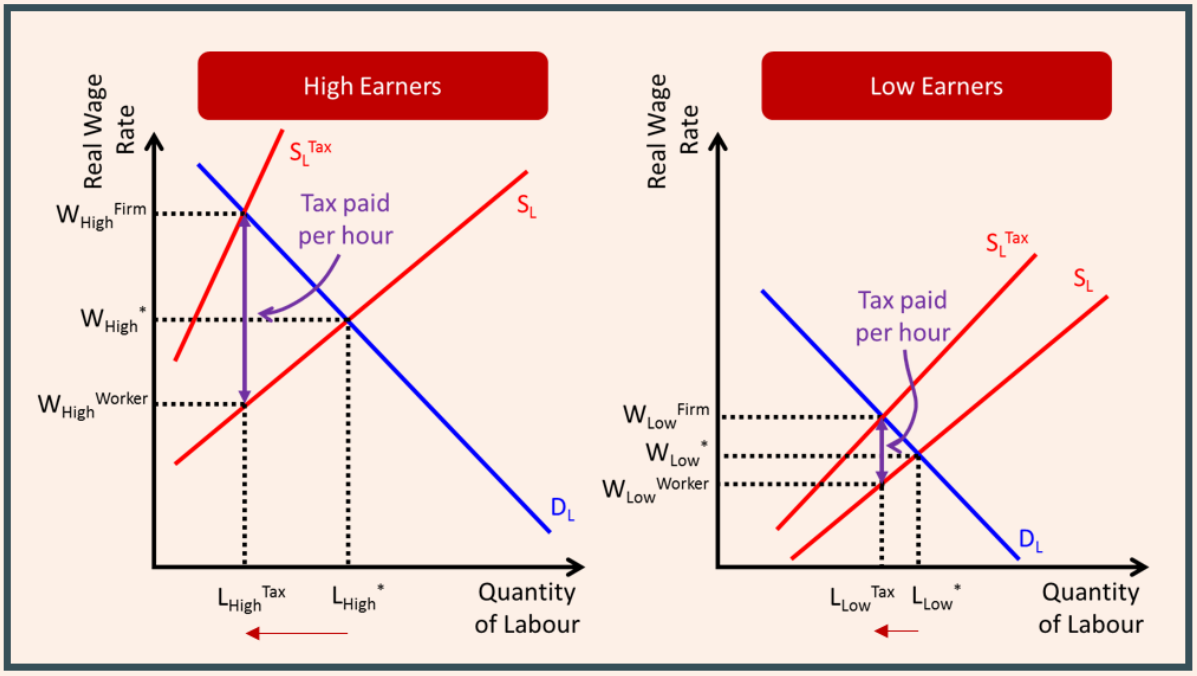
How would it be implemented?	The effect on firms' profits from being unable to attract the best employees	The trickle-down effect of consumption from high-earners
The reduction in incentives for workers to succeed and the reduction in innovation/effort	Potential for multi-national firms to relocate to other countries	

(More) Progressive Taxation

The progressiveness of taxation details the extent to which the marginal rate of taxation paid by workers increases as their labour market incomes increase. For example, a highly progressive taxation system would have very low marginal taxation rates for low earners but very high marginal taxation rates for high levels of earnings.

Most countries enforce a taxation system which is progressive – it is the degree of progressiveness which differs.

Similarly, to the in-work benefits discussion, this can be helpfully represented by a diagram, although analysis without a diagram would be acceptable:



The explanatory discussion might appear like this:

"In the diagrams above, the government has implemented a highly progressive taxation system. For industries where earnings are high, represented by the diagram on the left, the taxation system results in a large inwards shift in the supply curve from S_L to S_L^{Tax}.

This causes a large fall in employment from L_{High}^{*} to L_{High}^{Tax}. Firms must also pay a significantly higher wage rate, (W_{High}^{Firm} rather than W_{High}^{*}). Despite this, the

wage rate received by these workers falls significantly (as the incidence of the taxation is shared), from W_{High}^{*} to W_{High}^{Worker}.

The effects of taxation in the low-paying industry are all the same in terms of direction, however because the rate of taxation is significantly lower, the size of each of the effects are consequently also lower. Overall, therefore, the progressive taxation has a far greater dampening effect upon the wages received by high earners than that of those receive by lower earners, helping to make the distribution of income more equal."

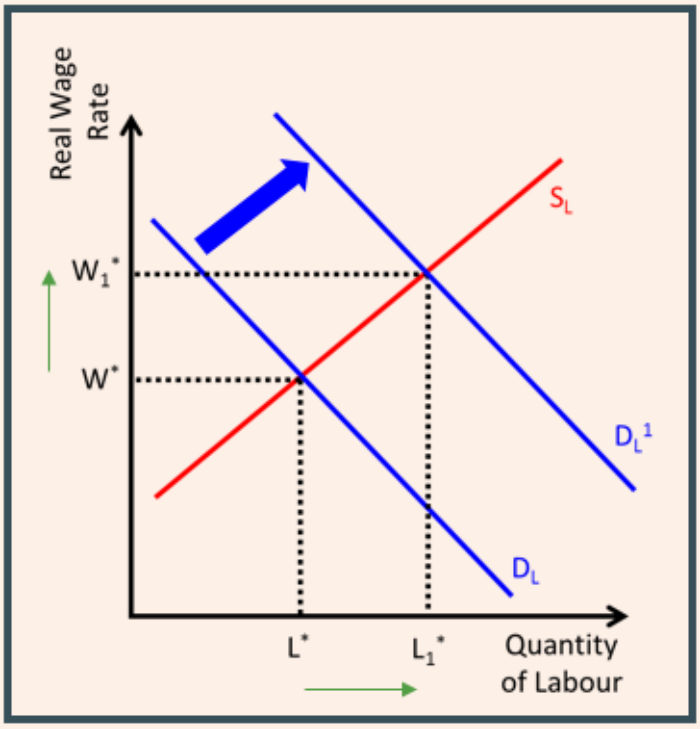
Further analysis of this potential intervention might include the following:

- The impact of reducing the employment of the highest-earning, most productive workers
- The effect on firms' profits from being unable to attract the best employees
- Laffer Curve effects
- The potential for the government to use taxation revenue for other policies
- The reduction in incentives for workers to succeed and increase their earnings

Investment in Education and Training

Increased government investment into the provision of education and training programmes is likely to increase the productivity of an economy's workforce. This in turn will increase the marginal revenue product of workers. If increased investment is focused upon increasing the productivity of low-skilled workers then the effects upon the labour market can have a significantly positive effect upon the distribution of income.

Again, this is most easily and effectively explained with the help of a diagram:



The explanatory discussion might appear like this:

"An increase in the productivity of the low-skilled through better access to education and training will have the primary effect of increasing workers' marginal revenue product. This is represented on the diagram above by an outwards shift in the demand for labour curve from D_L to D_L^1 as firms demand more of these more productive workers.

The effect of this upon pay differentials is two-fold. Firstly, the real wage rate received by these low-earners increases from W^* to W_1^*. Secondly, the amount

of labour employed in this now higher-paying industry, increases from L^* to L_1^*. Together, these effects will increase the incomes of those towards the bottom of the distribution of income, thereby improving inequality."

Further analysis of this potential intervention might include the following:

The opportunity cost to the government of investing more in education and training	How feasible it is to target additional educational resources at the low-skilled.
The time frame of the effects coming through.	The impact of education and training on the supply of labour curve

There are a variety of other potential interventions you could analyse including (but not limited to):

Legislated Wage Ratios

- Forcing companies to ensure that their highest earners are not paid more than a certain multiple of their lowest earners.

Unemployment Benefits and Support

- Whilst it might be slightly contentious as to whether this is an intervention in the labour market to improve pay differentials, it certainly will have an effect upon the distribution of income as the unemployed are the most likely to be at the very bottom of the distribution of income.

Universal Income

- A recently touted idea by some economists to replace unemployment and in-work benefits with a state provided sum paid to every member of society regardless of their income level. Designed to support low earners and the unemployed and remove some of the disincentives to work that benefits which reduce as income increases result in, its potential impact upon the distribution of income is being investigated by economists currently.

The key with the potential interventions that could be analysed is to understand that there simply is not the time to analyse them all. The best strategy is to very effectively detail only two or three of them.

Hopefully by analysing specific interventions you will have discovered that normally efforts to reduce pay differentials and improve the distribution of income come with accompanying economic costs. This represents a trade-off between equality and other economic factors.

A paragraph to explicitly highlight awareness of this trade-off would be powerful and would represent high-level analysis and allow for movements into powerful evaluative points. For example:

"It is clear that 'free lunches' are hard to come by. Acting to curb pay differentials and therefore improve the distribution of income rarely can be achieved without negatively affecting other economic factors. As a result, effective policies should consider the trade-offs which arise on an intervention-by-intervention basis."

AO4: Evaluation

Including accurate and relevant evaluation in your essay is the most important thing to ensure you achieve top marks. Evaluation is the art of making supported judgements, of deciding which factors are most important and of explaining in what circumstances particular factors assume the most importance.

There are many evaluative angles you could take within this essay. The points you effectively make will be dictated by the particular interventions you have focused on in your essay. Here we will showcase some useful general examples which could be adapted and applied to individual interventions or evaluate the overall premise of the question. You would not be expected to include all of these examples – there simply is not enough time!

The Initial Extent of Inequality

- Just how unequal a society is will affect the size of the potential societal benefits from improving the distribution of income. An economy with exceptionally high pay differentials may be more likely to decide that improving them are more important than other economic factors which form the part of a trade-off.

The Size of the Intervention

- Whether it be what level the minimum wage is set or quite how high the taxation rate of high earnings are, discussing how the size of the intervention will affect the size of the economic effects is a very useful evaluative tool.

Time Frame

- Some interventions may only result in improvements in the distribution of income over a lengthy time period (i.e. in the long-run). Alternatively, practicalities might mean that a particular intervention has to be inplemented gradually. This lack of an instant result may distort the trade-off between using the intervention to improve the distribution of income and other economic factors.
- Any changes to the incentives for workers to work hard and be successful may have long-term consequences for the productive capacity of the economy which are hard to predict. It may reduce the incentive to promote innovation and invention and may mean creative destruction occurs.

Government Failure

- Any government intervention runs the risk of causing unintended consequences. Interventions in the labour market may run a particularly high risk of resulting in government failure as they affect the incentives on offer to workers and firms. Organisations and individuals are often capable of ingenious ways to get round the intended results of a government intervention.

Government Finances

- The ability and appetite of the government to engage in costly labour market interventions will depend upon the state of its financial position. A government with a large deficit and national debt may prioritise other economic objectives over an equal distribution of income.

Labour Elasticities

- For many interventions, a compelling evaluation can be built around a discussion of the likely elasticity of labour demand and/or supply. This evaluation can often be presented with the assistance of a diagram.

Equity

- Any discussion about equality can quickly lead to a debate about how closely equality represents equity (fairness). Some argue that actually some degree of inequality represents fairness as it reflects different levels of talent and effort within the workplace.

Overall, it is important to provide in your essay, a reasoned judgement; an argument which makes a decision about whether government intervention in labour markets to eliminate pay differentials would, overall, be good or bad. It doesn't matter which side of the argument you make the case for – you will be examined on how effectively you structure that argument and how well you support it with economic theory.

The concluding paragraph of your essay is often a very good place to make clear what your overall reasoned judgement of the question is. Some people also like to include a similar judgement in their introduction, to signpost clearly to the examiner that they will be making an evaluative judgement in their essay.

Here is a good example of an attempt to, in one paragraph, argue that government should intervene to reduce pay differentials:

"Overall, the case for government intervention in labour markets is persuasive. Despite the economic trade-offs which are likely to be present in any attempt to improve the distribution of income, reducing pay differentials and in doing so increasing the welfare of the worst-off in society should be, within reason, the highest priority of the government. This is especially so in economies like the UK

where extremely high pay in sectors including financial services diverts an inequitable share of economic resources towards a small section of society."

Alternatively, it would be just as valid to argue that governments should, on balance, refrain from intervening in labour markets:

"On balance, government intervention in labour markets should be avoiding in most circumstances. Whilst concerns about income inequality and pay differentials are valid, any attempt by a government to actively solve these issues is likely to, at best be ineffective, and at worst negatively impact more important economic objectives. The most pressing concern for the government should be able increasing the incomes and welfare of all in society, not focusing upon re-distribution away from the well-off towards those at the bottom of the ladder and in doing so reducing the size of the overall pie."

Essays are marked on a levels basis. The overall quality of your essay will be considered when deciding upon which level the answer is.
Level 1 [1 – 5 Marks] – Very weak response which includes little relevant content.
Level 2 [6 – 10 Marks] – Weak response which shows some understanding but undeveloped analysis.
Level 3 [11 – 15 Marks] – Reasonable analysis but poor evaluation, which is usually unsupported.
Level 4 [16 – 20 Marks] – A well organised response with good analysis and some reasonable evaluation.
Level 5 [21 – 25 Marks] – A well organised response with good analysis and supported evaluation throughout and in a final conclusion.

Question 13

Explain how the development of fracking sites in the UK can result in the production of negative externalities for society.

[15 marks]

The key to answering this 15-mark question effectively is to realise that there are no marks available for evaluation. This question is focused upon examining your ability to present structured analysis, relying heavily upon well-written chains of reasoning. It is important to ensure that your response answers the question and provides a relevant and technically correct explanation.

Be careful to read the question carefully – here the question is demanding an explanation of how fracking sites can produce negative externalities for society. This will need a focus upon the economic fundamentals which result in negative production externalities being produced from the process of fracking. An easy mistake to make would be to focus your answer on the economic reasons for and against fracking and potential solutions to this form of market failure. Whilst not completely irrelevant to the topic being discussed, this kind of response would not be effectively answering this specific question.

A good (but not the only) approach to this question is:

Step 1: Introduction

The introduction provides an opportunity to demonstrate that you understand what topic the question is asking you about and structure your response accordingly. It is also a good opportunity to demonstrate some knowledge (AO1) by providing definitions of the key terms and some application (AO2) by making a clear link with the context.

The question focuses upon market failure within the context of the UK shale gas industry

The example below makes a clear reference to the context, by providing an appropriate and applied definition (negative externalities) and sets up the rest of the answer by describing what we are trying analyse (how negative externalities arise from this industry). As this is an externalities question at least one example of a negative production externality arising from this market should be mentioned.

"Externalities exist in a market when the production or consumption of a good or service imposes an effect upon a third party. When this effect is construed to be harmful to society it is classified as a negative externality. In the last decade, the development of fracking as an economic activity, has led to a flurry of external costs to be imposed on society. This is because fracking involves the process of drilling deep into the ground and injecting a high-pressure water mixture into shale rocks to release difficult-to-reach resources of oil and gas, which can help the UK satisfy their future energy needs. Despite the economic benefits it will undoubtedly supply the UK energy market with, the extensive use of fracking around the world, has prompted serious environmental concerns from local campaign groups."

This is because fracking creates environmental pressures such as: a greater number of pollutants released into the atmosphere, contamination of local water supplies, destruction of protected local areas, added noise pollution from the construction and maintenance of fracking sites and respiratory problems created because of higher pollution. These external costs ultimately create a divergence between the marginal private cost and the marginal social cost which results in market failure, creating an inefficient allocation of scarce resources."

Once the basic economic concepts have been defined within the context you are considering, you then need to be able to proceed to analyse why the negative externalities create a divergence between the marginal social cost and marginal private cost and the ramifications this has on the market outcome.

Step 2: Analysis

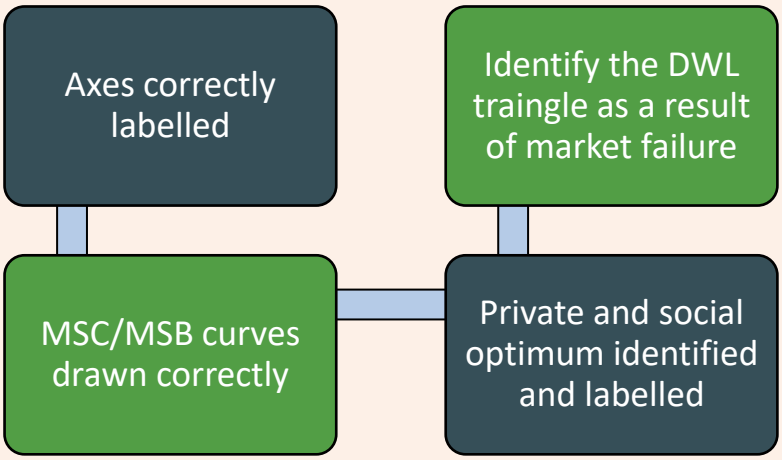
To further demonstrate relevant knowledge and application (AO1 & AO2) skills, beginning the heart of your response with a discussion of the logical chain of reasoning behind how a negative externality damages society's welfare is important:

"The externality produced in this type of market is a negative production externality because it results in external costs being imposed on society by the increased production of shale gas. This means there is a cost to society that is not considered in the process of making a production decision by the firm. This

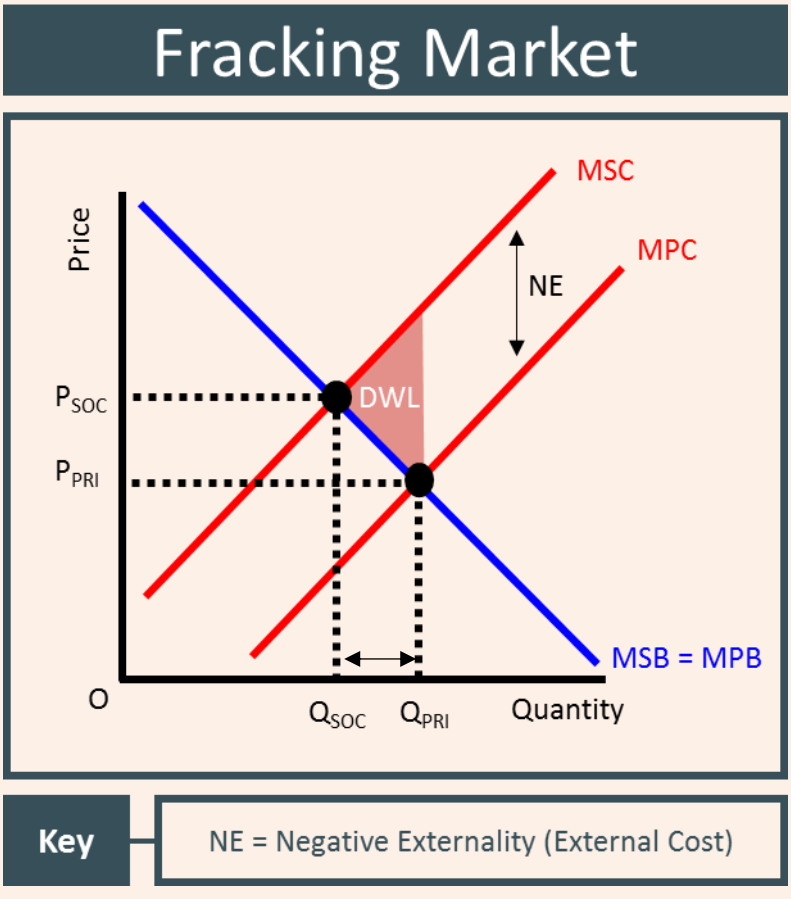
results in the marginal social cost exceeding the marginal private cost for this industry, as the marginal social cost represents the marginal cost of production plus the external costs created because of environmental problems.

This initial discussion leads nicely on to applying the increased shale gas production to a MSC/MSB diagram.

In your MSC/MSB diagram, the following features should be present:



Use a ruler and ensure the diagrams are neat and tidy.



Here the MSC/MSB diagram, which represents the fracking industry, has been drawn with the MSC curve above the MPC curve at every quantity. This is because the fracking firm does not suffer the local environmental costs produced by increased fracking and therefore may not realise the external cost they are imposing on society, as they will only be concerned with the private cost of production. Therefore, this creates a misallocation of resources as firms are producing too much shale gas at too low a price. The vertical distance between the two curves represents the size of the marginal external cost that is imposed on society by producing an extra unit of output. This negative externality in production is delivered and received to third parties outside of the market.

The red shaded area represents the deadweight loss to society which exists when output is at Q_{PRI}. This output represents the private optimum for firms as it is the point when the MPC = MPB. The deadweight loss is created because the social optimum is at a lower output level at $Q_{SOC.}$ This output represents the social optimum because it is the output level where MSC = MSB.

As the private optimum is at an output level above the social optimum, at all units between these points, the MSC is greater than the MSB and when this occurs a net welfare loss on each of these quantities is made. Therefore, the dead weight loss triangle represents the accumulated loss of welfare over the range of units between Q_{PRI} and $Q_{SOC.}$ If this output gap was closed social welfare would increase. When production takes place at the socially optimal output i.e. MSC=MSB, the deadweight loss triangle is eliminated.

To guarantee maximum marks, your answer may need to expand a little further than the analysis thus far offered. There are a variety of relevant issues which can be analysed when explaining how negative externalities arise in this market.

Regulation

- Regulation introduced by the government can help to manage the market and ensure that the production of externalities is kept within acceptable levels.

Producer Incentives

- Firms that contribute to the environmental pressures from fracking have no incentive to take action to reduce the costs they have imposed on others as it does not directly impact their own costs. This is why effective government intervention in markets with negative prodution externalities involves the government imposing the external cost onto the firm e.g. through taxation.

Allocative Efficiency

- You may also make reference to the fact that the overproduction of the good is a sign that the market is allocatively inefficient as there is a misallocation of scarce resources. Due to the nature of scarcity, if too many economic resources are being diverted towards the fracking industry, then it is the case that too few resources are being diverted towards other industries, resulting in market failure elsewhere.

This question does not examine your skills of evaluation, so you should focus upon using these issues briefly to push your analysis up to the top end! Your answer should take you no longer than 23 minutes. There is a lot of content you could potentially cover and therefore you should be aware that the priority is to effectively explain how negative externalities are produced by the development of fracking activities.

This question is marked on a levels basis. The overall quality of your response, including your diagram will be considered when deciding upon which level the answer is.

Level 1 [1 – 5 Marks] – Weak response which shows limited knowledge, application and unfocused analysis.

Level 2 [6 – 10 Marks] – Reasonable response that shows satisfactory knowledge and application with analysis which is reasonable but not fully coherent and/or fully developed.

Level 3 [11 – 15 Marks] – Organised and coherent response which demonstrates sound knowledge and application as well as strong analysis.

Question 14

Assess the view that taxation is the most effective form of government intervention in markets that are affected by negative production externalities

[25 marks]

To access top marks in any economics essay, it is important to focus on two key elements:

As essay structure is a more general skill, we will focus on showcasing how to hit the different assessment objectives required for this specific question. However, hopefully the following discourse will provide some assistance with regards to essay structure.

AO1: Knowledge

Being able to display accurate knowledge is judged to be the most basic requirement. It is still important to be able to demonstrate accurate knowledge throughout your essay. You can signpost this by including accurate definitions. For example, in your introduction you might want to provide a definition of government intervention in the context of a market that produces negative externalities. For example:

"Markets that produce negative production externalities impose an external cost onto society which results in the over-production of a good and an inefficient allocation of resources. Left to the free market alone, this is likely to result in market failure as private firms fail to consider the full cost of their actions.

The government can help rectify the market situation by affecting the incentives behind decisions made by individuals and firms. This can help move the market outcome closer to the social optimum so that welfare in the market is maximised. Indirect taxation is one appropriate way of dealing with markets

that fail, due to the production of negative externalities, as it aims to ensure that the producer pays the full cost of the negative externality."

Introducing your essay by showcasing your knowledge and understanding of the subject matter of the question will lay the foundations of your essay. In this section of the essay a detailed demonstration of your understanding of the key economic terms and concepts is required.

AO2: Application

The essay question is preceded by a contextual reference to the UK fracking industry. This particular industry offers a wealth of interesting application opportunities, which we will explore. Introducing application by referencing other industries would also be productive. Some examples include:

Enviromental Concerns

- Fracking creates environmental pressures such as: a greater number of pollutants released into the atmosphere, contamination of local water supplies, destruction of protected local areas, noise pollution from the construction and maintenance of fracking sites and respiratory problems created because of higher pollution.

Emerging Industry

- The UK fracking industry is an emerging industry where firms and governments are discovering the potential and problems that fracking shale gas and oil has on the UK economy. This means the level of uncertainty in this market is higher compared to more conventional markets.

Other relevant industries

- Manufacturing industries are often cited as prime example of markets which result in negative production externalities. The pollution and waste caused in the manufacturing process often imposes costs onto others in society that are not considered by the manufacturer.

Some of these application points require a high level of knowledge and understanding regarding the UK fracking industry. You are not expected to discuss all of these points.

AO3: Analysis

The core of top-level essays consists of well-constructed, relevant analysis of the topic. This should be presented using logical chains of reasoning, and where appropriate, clear diagrams.

There are lots of analytical routes you could go down with a question like this. The core analysis will involve an explanation of the advantages and disadvantages of using taxation to specifically deal with markets that fail due to the production of negative externalities. This analysis will be aided by using a diagram to show the impact that an indirect tax can have on internalising the externality. A good (but not the only) approach would be to consider the impact of an indirect tax being placed on a market where the good is over-produced and then discuss the alternative forms of government intervention which may or may not be as effective. This is because the phrasing of the question using 'most effective' is prompting you to talk about other means that are available.

Indirect Taxation

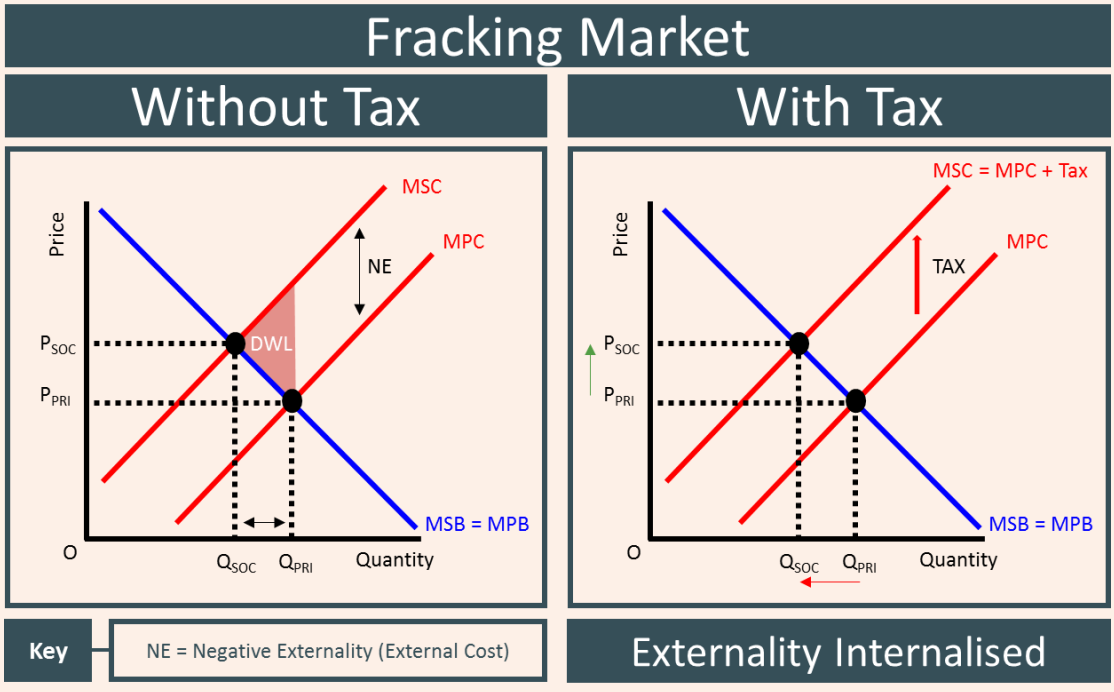
Before you go on to analysis the effect of an indirect tax on the market it is important to set the scene, regarding the initial market outcome without government intervention.

In the absence of government intervention, the UK shale gas industry is likely to produce negative externalities, as the process of fracking creates environmental concerns such as pollution. This means that there will be a divergence between the MSC and MPC, the difference representing the external cost passed onto society through the over-production of the good. This creates a market failure because the external costs of pollution are not considered by the producer. The following is a good example of a chain of reasoning which attempts to explain the implications of this:

"In the absence of intervention from the government, the fracking industry produces significant environmental problems such as the destruction of local areas and health problems imposed on society from more pollutants being dispersed into the atmosphere. These social costs are not imposed onto the shale producers that are involved in the production of shale gas and oil, but onto society. This means that producers will not consider the full costs of fracking in the UK and produce at the profit maximising point for them i.e. MPC = MPB. This equilibrium is likely to be above the social optimum (MSC = MSB) and therefore the overproduction of the good results in an accumulated deadweight loss for society."

Taxation is one method of intervention that can be used to correct the market failure. Indirect taxes are taxes that are imposed on the producers of goods and services and these taxes can be passed onto the consumer. In this case, the tax is intended to make UK shale producers pay the full social cost of the materials they are fracking from the ground at fracking sites. If the tax is equal to the external cost of production (negative externality), then the tax will effectively increase producer's private costs so the private costs of production equals the social costs of production.

This chain of reasoning would be very well-supported by standard MSC/MSB diagrams. At A-level you are expected to represent externalities using a MSC/MSB diagram so that you can apply marginal analysis to explain how the tax being imposed on the market internalises the negative production externality.



The tax that is imposed always represents the difference between the original MPC curve and the new MPC curve (MPC + Tax). Because of the tax being imposed on the market, less shale gas and oil is produced at each price level resulting in output falling from the private optimum (Q_{PRI}) to the social optimum (Q_{SOC}). The price level has also increased because of producers passing on part of the tax onto consumers. The increase in price creates a movement up the MSB curve.

If the tax internalises the entire externality, the increase in the price and the contraction in the quantity produced results in an efficient allocation of resources and corrects the failure in the market. This is represented by the deadweight loss triangle being removed from the market as the optimal quantity is being produced.

Effects of Taxation

Having discussed the results of imposing an indirect tax on a market that fails because of the production of negative externalities, the question itself can now be answered by explaining the relative advantages and disadvantages of using this form of government intervention to create an efficient allocation of resources. The advantages include:

Corrects Incentives

- The tax aims to correct the incentives of the producer by imposing the full cost of the negative externality they produce onto their own costs. If the tax is significant enough it will encourage shale producers to try and develop more energy efficient alternatives or an energy friendly production process towards extracting the materials that they require. This may in fact slow down the development of the fracking industry and reduce the negative externalities produced in this industry over a longer period of time.

Internalises Externality

- If the tax imposed is set at the right level (equal to the external cost) then it will be effective in removing the deadweight loss triangle in the market. This is because producer costs will be equal to social costs and if a producer faces higher costs it will be incentivised to cut production.

Raises Economic Efficiency

- The tax reduces/eliminates the deadweight loss triangle by reducing the amount of overpproduction in the market. This results in efficiency benefits for the market as it moves towards a more efficient allocation of economic resources.

Raises Tax Revenue

- Provides the government with tax revenue which can be used to provide subsidies to help develop more energy efficient alternatives. The revenue can also be used to repair damage to the environment which may have been caused by setting up fracking sites in the UK.

The disadvantages of taxation include:

Sustainability

It can be argued that the imposition of taxes on firms in the fracking industry may not actually be an effective solution to the problem of pollution. This is because unlike production limits or bans this does not actually guarantee a reduction in pollution as taxes only aim to affect the firms incentives.

Significance and Size of Tax

- It is often difficult for governments to be able to accurately quantify the size of the externality being created and therefore it is difficult to set the right tax on firms. This is particularly the case for the UK fracking industry as there are lots of different environmental pressures created, which makes it difficult for governments to accurately place a value on the overall external costs that fracking imposes on the enviornment.

Tax Evasion

- It may be the case that even if UK shale producers have an indirect tax imposed on them to change their incentives, they may find a loophole in the tax system to avoid paying this tax. If so, this may prevent certain firms from taking into account the external costs, which causes the market to still have an inefficient allocation of resources.

Incidence of Tax

- The effectiveness of using taxation to internalise an externality will be reduced, if the producers pass on a large percentage of the tax to consumers. This is because when an indirect tax is applied to a producer they can decide to pass on a percentage of the tax to consumers to reduce their overal tax burden. If demand is relatively inelastic, then this encourages producers to pass on more of the tax to consumers, which means that the private costs of the producer may not increase by as much as is required for the tax to internalise the extrnality.

Administration Costs

- It can be very costly in terms of time, resources and money to not only administer taxes on firms but also to monitor the behaviour of firms ex-post to ensure that taxation has in fact altered the incentives of firms.
- Introducing a less government-involved solution such as tradeable pollution permits might be a less costly solution to administer.

Alternative Forms of Government Intervention

The question is asking you to assess whether taxation is the 'most effective' form of government intervention towards tackling negative production externalities. Therefore, some alternatives should be discussed. This will enable you to talk about the relative advantages and disadvantages of these forms of intervention have over taxation. Here are some examples of alternative forms of government intervention:

Legislation

- The government could decide to limit or ban the production of polluting firms in the UK shale industry. This enables the government to prevent the overproduction of the good in the market and restore efficiency.
- This provides an alternative to taxation because by placing a production limit on the producer it reassures society that environmental damage will decrease by a precise amount.
- A direct ban on the production of a good is often only considered if the dead weight loss traingle that emerges is so large that actually internalising the externality is not feasible with the current information the government have.
- The downside with this form of intervention is it can sometimes be very difficult for the government to enfore this limit/ban effectively, as many firms may have the incentive to 'cheat' on this agreement. Even if the government has punisments in place to penalise producers defecting from the agreement, these fines may not be a large enough expense as a proportion of total costs to change the incentives of the defecting firm.

Increased Environmental Standards

- The govrnment could pass a law relating to the enviornental standards that the producer has to abide by. This is an alternative way of internalising the externality, as the firm itself is reponsible for the ensuring that they can meet the agreed environmental regulation. The idea is that any firms that do not currently meet the standards, need to invest in order to do so, which raises the marginal private cost.
- This can create wider economic benefts for society because the firm may have to invest in order to develop the production process so that environmental standards are met. Knowledge spill-over effects from one firm to another can help reduce environmental concerns in related energy markets.
- Difficult to universally apply environmental standards to all firms within the market and some emerging firms may not have the resources to invest, which could lead to a reduction in competiton in the long-run.

Tradeable Pollution Permits

- If there is an agreed and tangible way of measuring the environmental damage that fracking brings to the ecosystem of local areas, then it may be possible to introduce and issue tradeable emission permits into the market as a market-based solution to the problem. It is essentially a market-based solution as the government holds the responsibility for initially issuing and distributing the permits and then firms trade those permits in order to ensure that each firm pollutes at the right level based on their production process.
- The permits provide firms with the rights to pollute up to a certain level, anything above that level and the firms need to buy more permits from other firms which do not require them. The process of buying permits increases the private costs of production for the firm.
- This provides a more equitable way of dealing with pollution as firms which have the most energy-efficient production processes are rewarded.

Subsidies

- The government may provide subsidies to firms, as a reward for keeping their pollution levels below a certain level.
- Despite this being an alternative strategy it is unlikely to be effective in the fracking industry as the enviornmental effects of fracking are often disputed and not easily measured, which means providing subsidies is not only a costly solution but one that is difficult to adminster as well.

Compensation

- Firms that pollute could be required to pay compensation to local residents that are negatively affected by the production of UK shale gas and oil. The compensation payments will increase the private cost of production for firms and will incentivise firms to reduce production.

Of course, you are only expected to propose and introduce some of these alternative solutions to taxation and **not** all of these, as otherwise you will not have time to develop enough evaluation points within your essay.

AO4: Evaluation

Including accurate and relevant evaluation in your essay is the most important thing to ensure you achieve top marks. Evaluation is the art of making supported judgements, of deciding which factors are most important and of explaining

There a huge number of evaluative angles you could take within this essay. Here we will showcase some useful examples. You would not be expected to include all of these examples – there simply is not enough time!

Difficult to Quantify Externality Size

- It is often difficult for governments to be able to accurately quantify the size of the externality being created and therefore it is difficult to set the right level of tax on firms. This is particularly the case for the UK fracking industry as there are lots of different environmental pressures created, which makes it difficult for governments to accurately place of a value on the overall pressure that fracking puts on the enviornment.

Market Failure vs. Government Failure

- If the government intervenes in a market with very little accurate and reliable information at its disposal, it will make ill-advised and uninformed decisions and this may in fact make the dead weight loss triangle in the market bigger than it was before intervention took place. This results in government failure. All industries involve uncertainties regarding the value and true cost of externalities that are produced but the UK fracking industry is an industry where there is a lack of concrete evidence that has been established regarding environmental pressures, which means the scope for government failure is likely to be higher in this industry compared to alternative industries.

Market Conditions

- It is important to not generalise the theoretical result that one form of government intervention will prove more effective than another form of intervention in all markets. This is because each market is different and the complexity and uncertainty surrounding the market changes as you move from one to another. For instance, in the shale industry, taxation may not be as effective a policy as compared to the airline industry because the evidence regarding the enviornmental concerns from fracking is not as clear-cut as it is in the airline industry.

Unintended Consequences

- Some forms of government intervention could create unexpected side-effects which damage the efficiency and welfare of the market in the long-term. For instance, imposing sticter environmental standards on firms in the UK shale gas and oil industry may create job losses and ultimately lessen competition in the market, because it is not appropriate to universally apply environmental standards to all firms within the market. Some some emerging firms may not have the resources to invest, which could lead to a lessening in competiton in the long-run. This is a particuarly important issue to consider in the UK fracking industry as it is a upcoming and devloping industry where lots of new firms have recently taken up a position in the industry.

Equity Concerns?

- When deciding upon imposing a tax on firms that operate in the UK shale gas and oil industry, there may be concerns regarding whether the form of government intervention is in fact equitable or not. This is because it can often be difficult for the government to identify not only what firms are polluting but more importantly to what extent each firm is responsible for the enviornmental damage and pressures created.

Cost of Administration

- It is important to take into account the cost of planning, setting and policing forms of legislation in the market to correct negative externalities. This is because if the cost of administration exceeds the cost of pollution itself to society, then it is debatable whether in fact it is beneficial to intervene in a market that produces negative externalities.

Overall, it is important to provide in your essay, a reasoned judgement; an argument which makes a decision about whether taxation is the most effective form of government intervention towards correcting markets that fail as a result of the production of negative externalities. It doesn't matter which side of the argument you make the case for – you will be examined on how effectively you structure that argument and how well you support it with economic theory.

The concluding paragraph of your essay is often a very good place to make clear what your overall reasoned judgement of the question is. Some people also like to include a similar judgement in their introduction, to signpost clearly to the examiner that they will be making an evaluative judgement in their essay.

Here is a good example of an attempt to, in one paragraph, argue that taxation is the most effective form of government intervention:

"Overall, the case for using taxation as a way to rectify the market failure in industries exhibiting negative production externalities is persuasive. Whilst there are some concerns about how effectively a government can establish what the right level of the tax should be and how to effectively implement the intervention, in today's modern society this concerns should be diminished. Governments are able to use a variety of techniques to ensure their estimates are good and their interventions will be successful. Moreover, done right, taxation can ensure a complete solution to this market failure by forcing the producers to fully internalise the externality."

Alternatively, it would be just as valid to argue that an alternative form of government intervention should be considered when considering the UK fracking industry:

"On balance, indirect taxation should not be considered to be the best solution when trying to rectify negative production externalities. The uncertainty present in many industries means that any intervention by a government, at best an arms-length away from the production practicalities, is likely to mis-estimate and produce government failure. Far better to introduce a market-based solution like tradeable pollution permits, which incentivises firms to adapt and change their ways but provides flexibility for those who struggle initially."

Essays are marked on a levels basis. The overall quality of your essay will be considered when deciding upon which level the answer is.
Level 1 [1 – 5 Marks] – Very weak response which includes little relevant content.
Level 2 [6 – 10 Marks] – Weak response which shows some understanding but undeveloped analysis.
Level 3 [11 – 15 Marks] – Reasonable analysis but poor evaluation, which is usually unsupported.
Level 4 [16 – 20 Marks] – A well organised response with good analysis and some reasonable evaluation.
Level 5 [21 – 25 Marks] – A well organised response with good analysis and supported evaluation throughout and in a final conclusion.