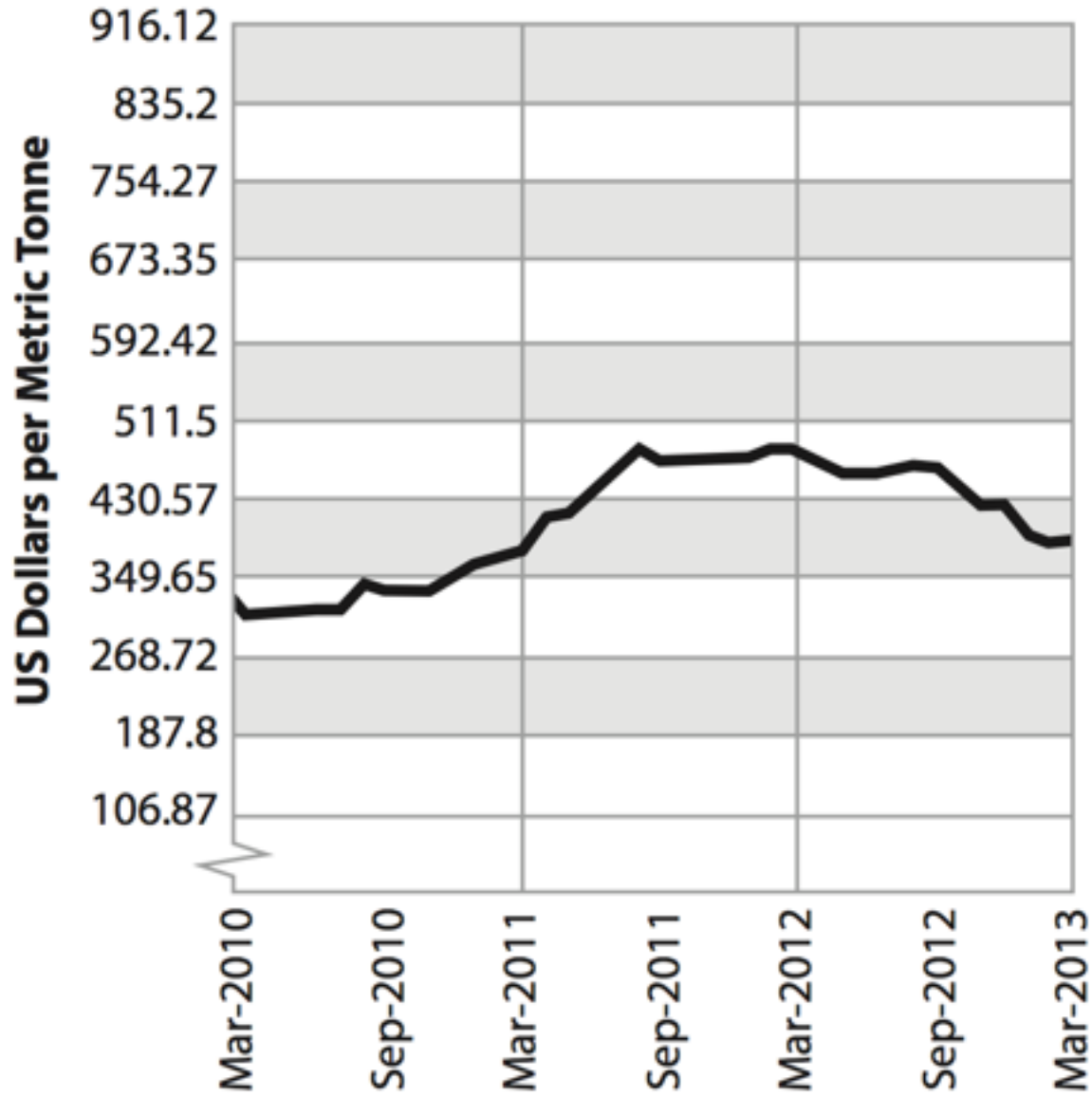


**AS Micro: Data Response Question on  
Potash Mining (EdExcel) May 2014**

**Figure 1 The price of potash**



## **Extract 1 The proposed potash mine in North Yorkshire Moors National Park**

Soaring global demand for potash, a powerful fertiliser used in farming, has pushed its price above \$400 a tonne. This follows pressure from an increasing global population and the more widespread use of intensive farming methods across many countries including Brazil, India and China.

Recent test drilling in the North Yorkshire Moors National Park, by the company Sirius Minerals, has almost doubled the estimated potash deposits from 1.3 billion to 2.2 billion tonnes. Situated a mile below the surface, it is the world's largest deposit of potash. The company has proposed to build a mine to extract the mineral which took millions of years to form from deposits of an ancient sea. Only one potash mine currently operates in Britain and domestic supply cannot meet demand.

If the mine is developed more than a thousand jobs will be created, many of them highly skilled. Local landowners who own the mineral rights will receive royalty payments in excess of £1 billion (US \$1.5 billion) over fifty years. With an estimated production cost of \$37 a tonne, the mine is likely to be highly profitable even if the price of potash were to halve from its current level.

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The mine could produce 20 million tonnes of potash a year, most of which would be for export. It could supply all of Britain's potash demand several times over. Britain currently imports potash from Germany and Canada.

## **Extract 2 Environmental impact of proposed potash mine**

The Campaign for National Parks said it was very concerned about the negative environmental impact of locating the potash mine inside a National Park. It believes alternative sites are available outside of the park boundaries. Before work on the mine can begin Sirius Minerals needs to gain approval from the North Yorkshire Moors Park Authority.

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Research carried out by the North Yorkshire Moors Park Authority claim the mine would damage tourism, leading to a 15% drop in visitor numbers and up to £40 million in lost spending a year.

However, Sirius believe the mine would not adversely affect tourism. Jason Murray, Finance Director for Sirius, believes the high price of potash has made it possible to spend money on reducing the environmental impact of the mine. Most of the operation will be underground, including the transport of the potash through a 28-mile pipeline to a processing plant on the coast. This will greatly reduce the use of lorries to transport the mineral.

10

(Source: adapted from Rupert Neate, @ Guardian News and Media Ltd, 1 February, 2013)

(a) With reference to Figure 1 and Extract 1, explain why the price of potash increased between March 2010 and March 2012. Use a supply and demand diagram in your answer. (4)

(b) Analyse why the price elasticity of supply for potash is likely to be low in the short run. (6)

(c) Using the information provided and your own knowledge, assess the possible problems of fluctuating prices for producers of potash. (10)

\*(d) Using the information provided and your own knowledge, discuss the case for allowing the potash mining project to go ahead in the North Yorkshire Moors National Park. (14)

\*(e) Discuss the factors which might influence the supply of labour to the mining industry or another industry of your choice. (14)

Knowledge

Application

Analysis

Evaluation

With reference to Figure 1 and Extract 1, explain why the price of potash increased between March 2010 and March 2012. Use a supply and demand diagram in your answer

Figure 1 The price of potash

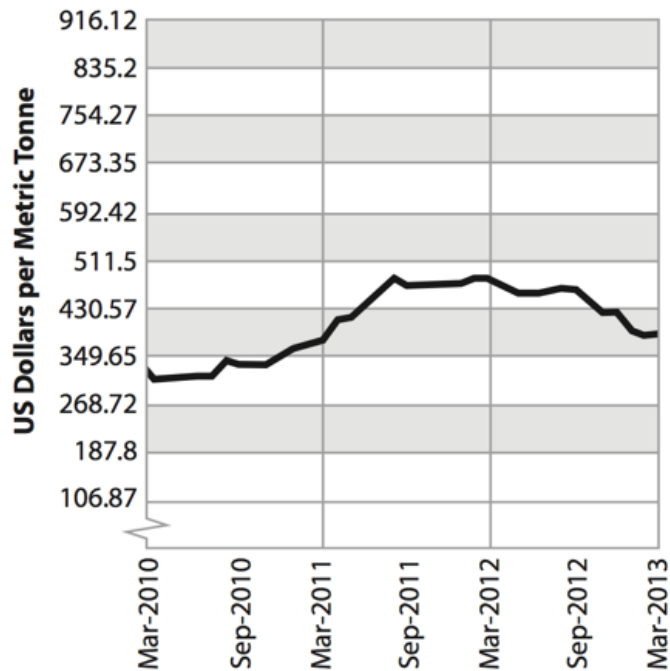
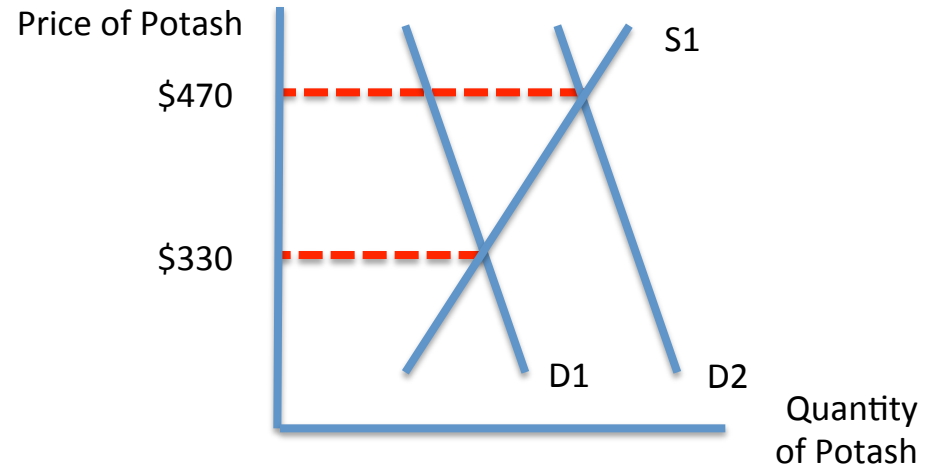


Figure 1 shows that the price of potash increased from circa \$330 in March 2010 to circa \$470 in March 2012, a rise of 40%. Extract 1 refers to “soaring global demand for potash” because of the growing derived demand for fertilizer. This is shown in the diagram where there has been an outward shift in the market demand curve causing an expansion of supply and a higher equilibrium price



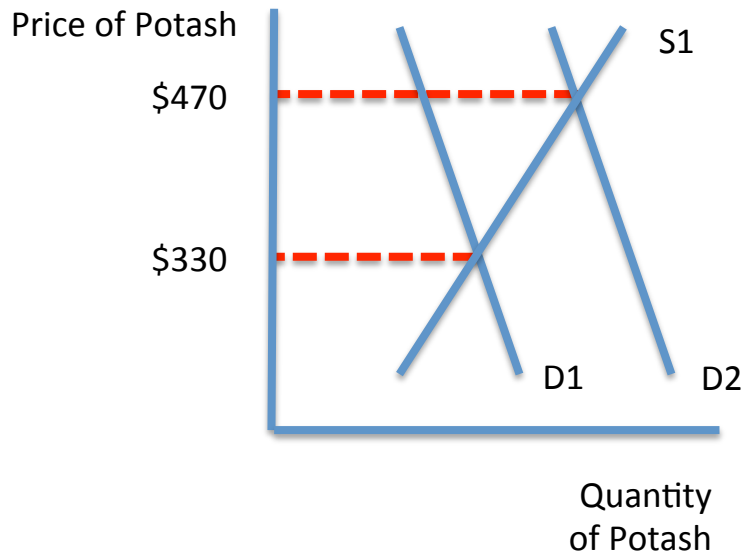
Knowledge

Analysis

Application

Evaluation

Analyse why the price elasticity of supply for potash is likely to be low in the short run (6 marks)



**Analyse** – means that no evaluation is needed. Only KAA is tested in this question!

**Price elasticity of supply (PES)** measures the responsiveness of supply to a change in market price. A low PES means that the coefficient of elasticity is less than 1. In the short run, PES is likely to be low because of the long time frame between discovering new potash deposits, getting planning permission and then organising the factor inputs to extract them. Extract 1 says that there is only one potash mine operating in the UK and that supply cannot meet demand. This tells us that the mine will be working close to **full-capacity** and that **stocks** of potash may be low. These are two factors making supply inelastic in the short run.

Knowledge

Analysis

Application

Evaluation

Using the information provided and your own knowledge, assess the possible problems of fluctuating prices for producers of potash (10 marks)

Figure 1 shows that the price of potash has fluctuated over the last 3 years. It has varied from \$330 in March 2010 to a high of \$500 in 2011-12 before falling back to \$390 in March 2013.

Volatile prices create problems for producers because it is hard for them to forecast their **revenues and profits**. Investment in exploration, drilling and extracting potash is expensive and involves a high degree of risk. If demand is price inelastic ( $P_{ed} < 1$ ) then a rise in market price will lead to higher total **revenues** and increased profitability. But if investment happens expand capacity and then the world price suddenly falls (for example due to a **slowdown in BRIC countries**), then potash suppliers will be left with unused capacity and falling prices which could leave them with unsustainable losses.

**However, Extract 1 says that the supply cost of potash is low at just \$37 per tonne. Given that the world price of potash has remained well above \$260 per tonne in recent years, even a high degree of volatility is unlikely to create major long-term problems for potash producers. They ought to be able to make a good profit.**

Knowledge

Application

Analysis

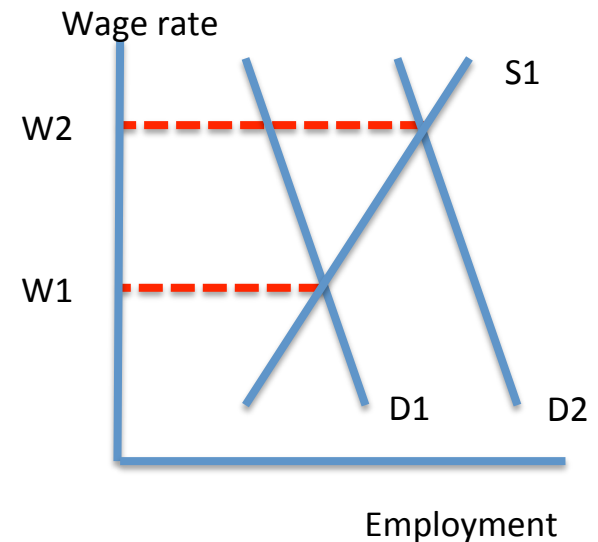
Evaluation



Using the information provided and your own knowledge, discuss the case for allowing the potash mining project to go ahead in the North Yorkshire Moors National Park. (14)

Extract 1 tells us that Sirius Minerals have discovered estimated potash deposits of 2.2 billion tonnes. One of the main arguments for allowing the mining project to go ahead is that it will create a large number of highly skilled, well-paid new jobs for the regional economy. This increased **demand for labour** (shown in my diagram) could lead to a strong **multiplier effect** helping to boost real living standards in a region where **GDP per capita is below the UK average**. New jobs could help to overcome structural unemployment from the loss of jobs in coal mining as there is a high level of **occupational mobility** between the two industries.

However, the final impact on unemployment would depend partly on whether these new jobs went to local workers. There might also be **skills shortages** causing potash producers to recruit from overseas. The employment effect would also be limited if potash mining is **capital-intensive**, i.e. heavy machinery might be used because it is more cost efficient.



Two further arguments are that local farmers might benefit from cheaper supplies of potash (a positive externality) and that exports of potash would rise helping the UK balance of payments (trade position)

Knowledge

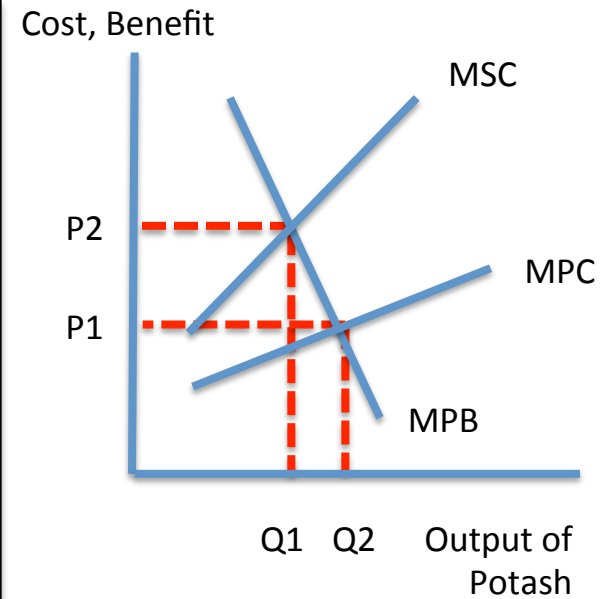
Analysis

Application

Evaluation

Using the information provided and your own knowledge, discuss the case for allowing the potash mining project to go ahead in the North Yorkshire Moors National Park. (14)

**Extract 1** tells us that the potash deposits are found in the North Yorkshire Moors National Park. Allowing mining to take place is likely to lead to **negative externalities** such as increased air & noise pollution and external costs from traffic congestion. This might cause damage to local tourism with **Extract 2** suggesting a possible 15% drop in visitor numbers. Without some form of **government intervention**, there is likely to be **market failure** because the **marginal social cost of production** is higher than the **marginal private cost**. This is shown in my analysis diagram. However, the **planning authorities** might insist that Sirius Minerals takes steps to reduce their carbon emissions. Potash mining is part of the **EU emissions trading scheme** which puts a price on each tonne of CO<sub>2</sub> so producers already have an incentive to control emissions. We are also told that, as part of the agreement, they are planning to invest in building an underground tunnel to transport waste materials.



Negative externalities are spillover costs arising from production or consumption for which no appropriate compensation is paid

Knowledge

Analysis

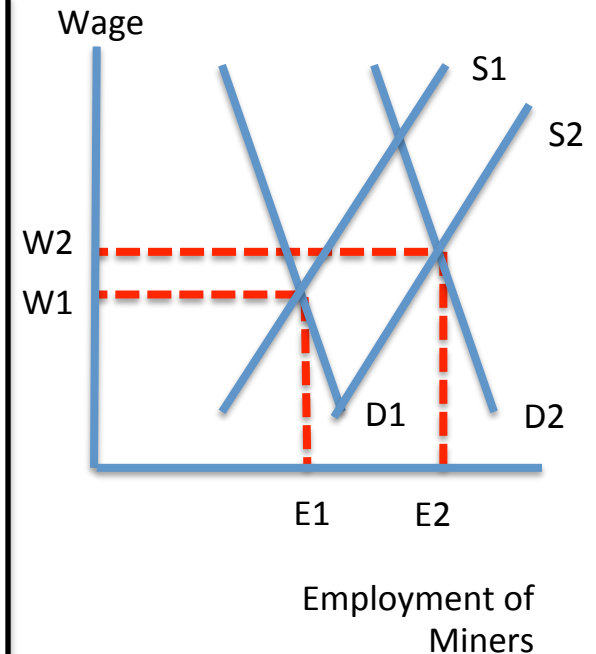
Application

Evaluation

Discuss the factors which might influence the supply of labour to the mining industry or another industry of your choice. (14)

The labour supply is the number of hours people are willing and able to supply at a given wage rate. The labour supply curve will be upward sloping because as wages rise, workers enter this industry attracted by the incentive of higher rewards. The extent to which a rise in the wage rate leads to an expansion in the supply of labour depends on the elasticity of labour supply. Extract 1 tells us that many of the jobs in mining are highly skilled which suggests that the elasticity of labour supply will be low in the short-term because of occupational immobility. Factors such as free movement of labour within the EU have the effect of increasing the labour supply; for example miners from Poland or the Baltic States might be attracted to work in the UK mining industry because of higher relative earnings. This is shown by an outward shift of labour supply.

Although wages are important, labour supply might be affected more by non-monetary characteristics – e.g. risk, working conditions, employer training and occupational pension schemes. Mining is well paid but it is also an insecure industry especially when world prices are volatile. This might cut the number of people willing to work in the industry and is perhaps the most significant factor affecting supply.



Knowledge

Analysis

Application

Evaluation

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