HWA CHONG INSTITUTION

C2 Preliminary Examination 2016

Higher 2 Economics

Case Study Question 1: The Coal Industry and Housing Market in the United Kingdom (UK)

Suggested Answers

(a)	**With reference to Extract 3, explain why the value of the price elasticity of supply of new housing in UK might change over time.**	**[3]**
	Define PES [1m] If there is no definition given, the idea of how responsive quantity supplied will be to a change in price must be captured in the student's explanation to get 1m. State + Explain that in SR: PES<1 [1m] Need time to build houses and in the short term, there is a "lack of materials and labour… bricks running out… construction workers left the industry" → lack of spare capacity State + Explain that in LR: PES likely >1 [1m] Availability of materials and spare capacity as "brick makers reopen plants" and skilled workers as former military personnel join the construction industry and training schemes help to train them to become skilled workers.	
(b)	**With reference to Table 1, explain whether the pricing policy by the electricity company could be considered an example of price discrimination.**	**[4]**
	Explain that the different prices charged for the usage of electricity could be due to 3rd degree price discrimination: [2m] - Define PD → charging different prices (day vs night) to different groups of consumers (day vs night) for the same product (electricity) due to reasons not associated with cost differences. - The different prices charged could be due to differences in price elasticity of demand. Day prices are higher as demand for electricity is more price inelastic due to higher degree of necessities in the day time where electricity is required for the functioning of the economy when most people are awake, e.g. business and production activities, school, households etc. Night prices are lower as demand is more price elastic due to lower degree of necessities. Most activities are not essential to be conducted in the night when most people will be resting. Explain that the different prices charged could be due to differences in costs: [2m] - During the day (peak), demand for electricity is higher, leading to higher marginal cost incurred and hence higher prices are charged. - During the night (off-peak period), nuclear and coal-fired stations, with lower operating costs, will be used. However, during peak period, power stations with higher operating costs (e.g. oil-fired stations) will have to be activated.	
(c)	**Using the information in Table 1, account for the difference in average house prices in London and Yorkshire.**	**[3]**
	Price difference likely due to differences in demand and supply: London has a higher average house price because: Higher demand due to higher annual income earned (£79,000) leading to higher purchasing power and higher population (8.5m) + Lower supply due to lack of land in the capital (1,572km^2) available for building new houses. Yorkshire has a lower average house price because: Lower demand due to lower annual income earned (£49,000) leading to lower purchasing power and lower population (5.4m) + Higher supply due to land available outside of the capital (15,420km^2) for building new houses. Demand factor [1m] Supply factor [1m] Account for difference [1m]	

(d)	**Explain the type of unemployment that might arise due to the closure of the two coal pits.**	**[2]**
	Structural unemployment [1m] as the mining industry is in a decline and the miners might not have the skills to work in expanding industries that require higher skills (since mining involves more manual labour). [1m] Note: Cyclical unemployment not accepted as the impact on the whole economy will be too small given that only 1300 workers will be affected.	
(e)	**Discuss the factors that the UK government should consider in deciding to redevelop the coal industry.**	**[8]**
	Possible factors: <u>Comparative Advantage + Impact on Macro Goals</u> If the government decides to redevelop the coal industry, it would have to consider whether the industry would be able to gain comparative advantage in mining coals. According to Extract 2, the UK "sits atop significant coal resources… enough to provide power for 300 years" and used to produce lots of coal in the past. Hence the UK has the factor endowment in coal and the expertise and she might be able to produce coal at a lower opportunity cost than other countries. If successful, X increases and M falls significantly (since UK imports more than 75% of its coal requirements – Extract 1) → BOT improves, BOP improves, ceteris paribus. AD increases leading to multiple increase in national income. Employment increases too. (Evidence: Extract 2 "potentially thousands of jobs could be created and … source of export revenue") <u>However</u>, the UK might not gain comparative advantage in coal production as the competition will be fierce with cheap suppliers from Colombia, Russia, India, China, South Africa, and the US (Extract 2). <u>Environmental Concern + Resource Allocation:</u> If the government decides to redevelop the coal industry, it would also have to consider environmental issues. Coal is "the dirtiest fossil fuel and emits more carbon emissions" (Extract 1). Should the UK redevelop the coal industry and use it as the main source for electricity generation, it will increase the carbon emissions in UK (negative externalities). Explain how negative externalities result in allocative inefficiency. <u>However</u>, with the new CCS technology, which could enable the coal-fired power station to trap and pipe harmful emissions underground out to under the seabed during the production of electricity (Extract 2), the problem of negative externalities/ pollution might no longer be an issue. <u>Evaluation:</u> Even though the CCS technology can reduce the problem of pollution during the production of electricity, it does not help to cut down the carbon emissions during the extraction of coal. <u>Strategic Reason:</u> "Getting coal off the grid… makes energy more expensive… lose the diversity of the generation mix… security of supply and affordability have been placed behind carbon emissions target" (Extract 1) → If the UK no longer produces coal, it will need to depend on other countries for the resource, making it more vulnerable to external changes (possible imported inflation, supply shocks). And if it no longer uses coal to generate electricity, it is more vulnerable should there be any supply shocks to the other energy sources. <u>However</u>, given that many countries produce coal (Extract 2: Colombia, Russia, China, and the US), the UK could always turn to other countries should the countries it imports from suffer high inflation or have supply shocks. <u>Conclusion</u> The UK government is unlikely to redevelop the coal industry as the coal industry is unlikely to gain comparative advantage even though it has significant coal resources. Extract 2 implied that even with the CSC technology, the "future for the British industry… won't be massive… 10 million tonnes a year", which is lower than the current output. Moreover, the coal industry "is urging the government to require domestically-produced coal to be used in future CCS plants". This implies that the coal industry will require protectionism in future, which means the domestic product is unlikely to be produced at a lower opportunity cost than other countries.	

Or any well-justified conclusion

Mark Scheme

L3 (6-8)	Balanced and well developed economic analysis, based on the case material with evident evaluation and judgment. 2 factors are enough. However, to earn top L3 marks, must have considered both macroeconomic aims and environmental concern.
L2 (4-5)	Answers tend to be lopsided (i.e. did not consider the drawbacks) or there is insufficient use of economics analysis. Little or no evaluation/judgment.
L1 (1-3)	Weak attempt in answering the question requirement. Major conceptual errors were evident.

(f) **Discuss whether the UK government currently adopts the most appropriate economic policies in reducing greenhouse gas emissions to achieve economic efficiency in resource allocation.** **[10]**

Introduction: The presence of greenhouse gas emissions (negative externalities) suggests that the free market has failed in the allocation of resources. Hence, the UK government targets to cut emissions by at least 80% from 1990 to 2050 to achieve greater economic efficiency in resource allocation. Whether the target is achievable or not would depend on the economic policies currently adopted.

Body: Explain how each policy works and assess its effectiveness and limitations

Power and Industry

Explain how **Carbon Trading with Carbon Price Floor** scheme works.

- *Extract 4: The EU Emissions Trading Scheme (EU ETS) requires all big factories and power plants to buy a permit for each tonne of CO2 emissions*.
- The EU estimated the socially efficient level of emissions and decided on the number of permits to be issued to the big factories and power plants, and they are allowed to pollute up to the permitted level only. If any of the big factories or power plants wants to pollute beyond the permitted level, it can purchase extra permits from others who might not need them. That is, the big factories and power plants can trade these permits among themselves, where the price of the permits is determined by the forces of demand and supply. The total level of emissions produced by all the big factories and power plants will not exceed the level set by the UK government.

Assess its **effectiveness and limitations.**

- The EU government lowers the overall cap on the emissions progressively to give firms time to react (e.g. to cut emission by adopting green technology) but with the intention for the level of emissions to reach the socially efficient level eventually.
- However, as the overall cap is lowered progressively, the current limit was set too high, causing these permits to trade at a "very low carbon price" of "£5-6 per tonne of CO_2", which will not truly reflect the external costs to third parties. The UK government has rectified this with the Carbon Price Floor scheme to ensure that there is a minimum price for the permits. By setting the carbon price above the market equilibrium price, the UK government aims to better reflect the external costs to third parties to ensure more efficient allocation of resources and to "provide long term certainty for low carbon investment" so that when more firms switch to more environmentally friendly methods of production to avoid buying the more expensive permits, the amount of EMC will fall.

Explain how **Transition to a Low-carbon Power Sector** works.

- By transiting to a low-carbon power sector, which uses renewables (such as wind, solar, and biomass), nuclear and carbon capture and storage (CCS), the UK government aims to reduce the amount of emission and hence EMC, so that the new market output will be closer to the socially efficient level.

Assess its **effectiveness and limitations.**

- The transition will require massive capital outlays, which will put a strain on the government's budget.
- Moreover, CCS is a new and untested technology that might not produce results. Hence, the opportunity cost is high.

Buildings

Explain how **retrofit improvement in the energy efficiency of homes works**.

- By insulating loft and cavity walls and replacing old inefficient boilers, the demand for gas for heating will fall. This policy aims to reduce PMB/ demand to coincide with the PMC at the socially efficient level.

Assess its **effectiveness and limitations**.

- The level of effectiveness depends on the take-up rate. Given that there is no upfront cost for consumers, as "the costs of the measures is paid back over time through electricity bills and payments are supposed to be less than savings through reduced energy bills (the 'Golden Rule')", this creates more incentive for households to take up retrofit improvement.
- However, as the loft and cavity walls insulation is a major renovation of homes, households might not take it up. It is also not compulsory for household to take up the retrofit improvement

Conclusion/Evaluation: Provide an overall stand on whether the UK government currently adopts the most appropriate economic policies.

- The UK government currently adopts a good mix of short-term and long-term policies in the power and industry and buildings sectors to reduce carbon emissions to achieve economic efficiency in resource allocation. The EU ETS and carbon price floor scheme force firms to internalise the external costs in the short-term and in the long-term, encourage the switch to low-carbon production to reduce emissions. The transition to a low-carbon power sector will reduce emissions in the long-term. The retrofit improvement will also help to reduce emissions in buildings in the short-term. Given that both sectors accounted for around two-thirds of total UK greenhouse gas emissions in 2013, the current policies will help UK to reduce carbon emissions significantly.
- However, the UK's "housing stock is among the oldest and coldest in Europe due to poor insulation and the cost of heating leaking properties is leading to a rise in fuel consumption", the UK government might want to regulate and enforce the retrofitting improvement instead of leaving it to the households to take it up voluntarily.
- Or any well-justified conclusion.

Mark Scheme

L3 (7-8)	A well-developed analysis on economic policies to achieve economic efficiency in BOTH Power and Industry and Buildings. There is good reference to the case material. Effectiveness and limitations of policies are well considered.
L2 (4-6)	An analysis on economic policies to achieve economic efficiency in either Power and Industry OR Buildings. There is analysis provided on economic policies to achieve economic efficiency in BOTH Power and Industry and Buildings BUT this analysis is under-developed with a lack of reference to the case material. Effectiveness and limitations of policies might not have been considered or considered superficially.
L1 (1-3)	Descriptive answer with minimum link to question.
E2	Provide good synthesis and a reasoned conclusion.
E1	Attempts to synthesize