



Oxford Cambridge and RSA

Monday 23 May 2022 – Afternoon

A Level Economics

H460/01 Microeconomics

Time allowed: 2 hours



You can use:

- a scientific or graphical calculator



Please write clearly in black ink. **Do not write in the barcodes.**

Centre number

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Candidate number

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First name(s)

Last name

StemUp Model Solution

INSTRUCTIONS

- Use black ink. You can use an HB pencil, but only for graphs and diagrams.
- Write your answer to each question in the space provided. If you need extra space use the lined pages at the end of this booklet. The question numbers must be clearly shown.
- Answer **all** the questions in Section A, **one** question in Section B and **one** question in Section C.

INFORMATION

- The total mark for this paper is **80**.
- The marks for each question are shown in brackets [].
- Quality of extended response will be assessed in questions marked with an asterisk (*).
- This document has **20** pages.

ADVICE

- Read each question carefully before you start your answer.

SECTION A

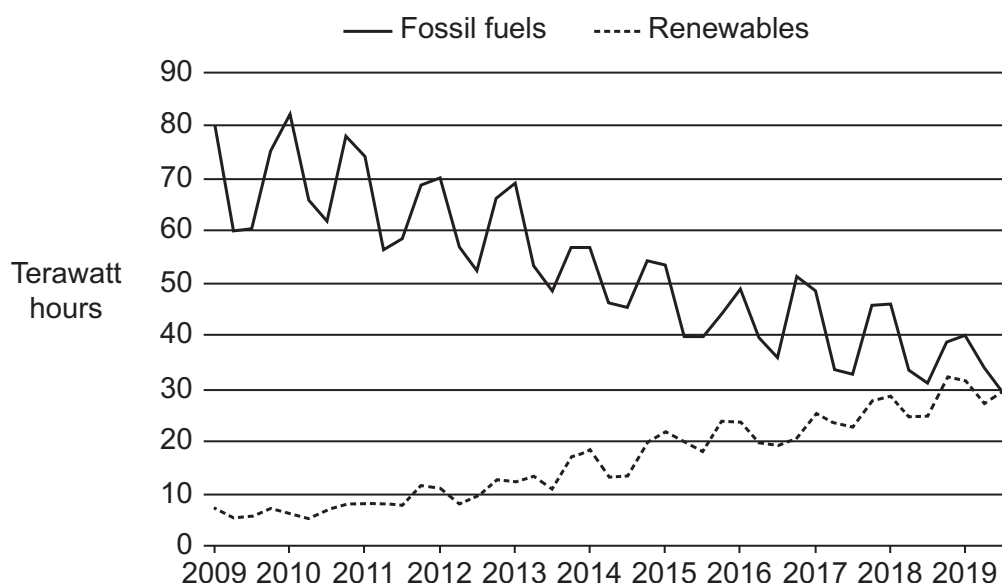
Read the following stimulus material and answer **all** parts of Question 1 which follow in this section.

Changing consumer trends in the UK?

Renewable energy sources, including wind, solar power and biomass, now provide more electricity to UK homes and businesses than fossil fuels, such as coal and gas. This was first achieved in the third quarter of 2019, see Fig. 1.

Fig. 1

UK electricity generation per quarter (measured in Terawatt hours)



Source: CarbonBrief

5 Coal is now used for less than 1% of electricity generation in the UK, with only four coal-powered plants remaining, ahead of a ban in 2025. Gas is the largest fossil fuel (38%) in the UK energy system. In terms of renewable energy sources, wind power is the UK's largest, making up 20% of the UK's electricity, followed by 12% from biomass and 6% from solar power. Nuclear power provides the remainder of the UK's electricity.

10 Kwasi Kwarteng, the government minister for energy and clean growth, said the renewables record is, "...yet another milestone on our path towards ending our contribution to climate change altogether by 2050. We've cut emissions by 40% while growing the economy by two thirds since 1990. Now, with more offshore wind projects on the way at record low prices we plan to go even further and faster in the years to come."

15 One of the largest firms in the UK is Shell, a multinational company. It provides 10% of the UK's oil and gas, employs about 6,000 people and serves over 5 million customers every week at more than 1,000 fuel service stations. It has the third largest number of fuel service stations, behind Tesco and BP.

20 However, Shell now faces the prospect of no more petrol cars, lorries running on liquid gas, and solar or wind powered homes and businesses. Even the fuel service station is changing, with most now seen as a retail outlet where people can do their food shopping, pick up a parcel or drink a coffee. Managers at Shell have taken all of these changes very seriously, as they attempt to reinvent the company which is also faced with new climate change targets. Some experts have compared the changes to a new industrial revolution.

25 Shell's managers have already taken some big decisions. Shell has bought a company which makes electric vehicle (EV) charging points for homes and workplaces. It has also bought a supplier of electricity and gas in the UK. Shell's managers see a time when the business will supply all of an individual's energy needs.

30 Shell is trying to take the lead in EV charging points for battery-powered cars. At present, less than 2% of cars on UK roads are battery-powered. However, by 2040 a third of all vehicles could be electric. Shell believes it is well placed to take advantage of this growing market, as it has already launched a 'rapid recharge service' which uses 100% renewable energy. It announced the opening of its 50th EV charging station in October 2019. Given its large number of fuel service stations and its strong position in the market, Shell plans to install hundreds more charging stations around the UK.

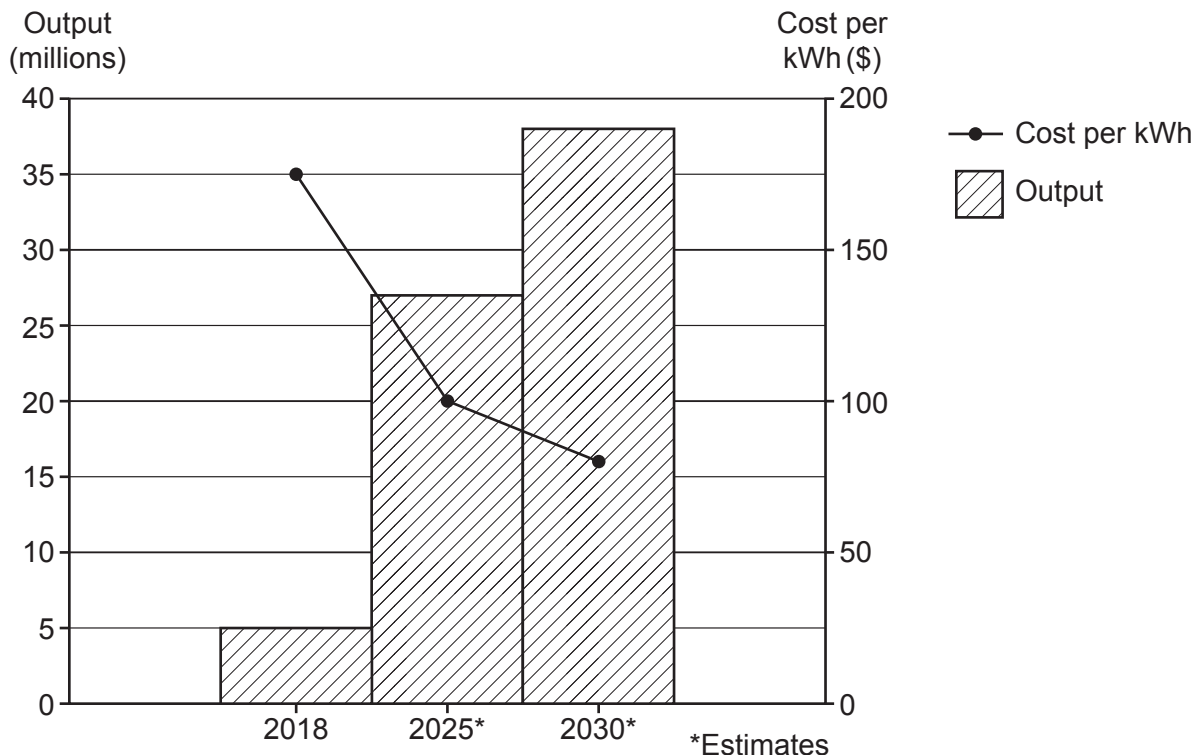
35 The growth in EV charging stations will be necessary if the UK government's 'Road to Zero' strategy, to ban the sale of new petrol cars by 2030, is to be successful. As part of this strategy, more taxes may be imposed to change the marginal private cost of using petrol cars, so that the price paid is closer to the marginal social cost inflicted on society. Once the price of battery-powered cars falls to a level closer to that of petrol cars, the use of a subsidy may also be beneficial.

40 One of the largest costs of running a petrol car is the petrol. The demand for petrol appears to be significantly price inelastic. A 2019 review of over 100 pieces of research about the price elasticity of demand for petrol found it to have a value of -0.26 in the short run and -0.58 in the long run.

45 Another limit on the growth of battery-powered cars is the cost of producing the batteries. Many experts say that a battery-powered car cannot be price competitive until the cost of a battery falls below \$100 per kilowatt hour (kWh), see Fig. 2.

Fig. 2

Global car battery production



Source: Daily Telegraph

Some experts argue that the structure of this market will affect progress as, along with the energy and power generation markets, it is really a natural monopoly.

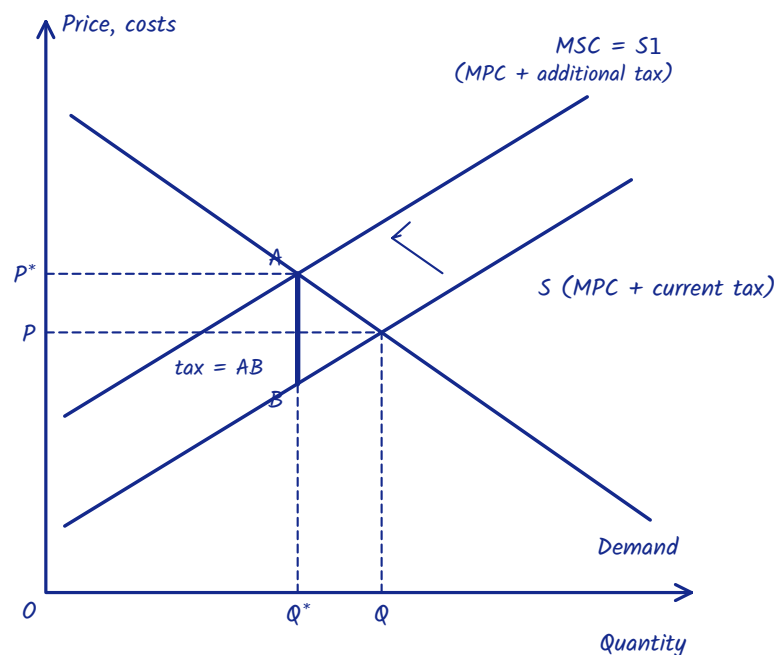
- 1 (a) Explain what is meant by the term 'subsidy'.

A subsidy is a payment (grant) made by the government to producers, which reduces their costs of production per unit. This encourages firms to increase output, shifting the supply curve to the right, so price falls and quantity rises.

[2]

- (b) "...more taxes may be imposed to change the marginal private cost of using petrol cars, so that the price paid is closer to the marginal social cost inflicted on society." Lines 36–38

Explain, using an appropriate diagram, how this could be achieved.



Petrol car use creates external costs, so MSC is above S (MPC + current tax) and price P is below the social optimum P*. A further tax of AB per unit raises costs, shifting S left to S1 (MPC + additional tax) = MSC, so price rises from P to P* and quantity falls from Q to Q*.

[4]

(c) Refer to lines 40–42.

Calculate the percentage change in price required to achieve a 6.5% fall in demand for petrol in the short run.

$PED = \% \text{ change in quantity demanded} \div \% \text{ change in price}$

$-0.26 = -6.5 \div \% \text{ change in price}$

$\% \text{ change in price} = -6.5 \div -0.26 = 25$

Price must increase by 25% [2]

(d) (i) Using the data in Fig. 2, explain how there are economies of scale in the global production of car batteries.

As output rises from 5 million in 2018 to an estimated 38 million in 2030 (up

33m), the cost per kWh is expected to fall from \$175 to \$80 (down \$95). Unit

costs falling as output increases in the long run shows economies of scale, e.g. bulk

buying of materials. [2]

(ii) Evaluate, using evidence from the stimulus material, whether it is a disadvantage if the market for car battery production is a natural monopoly. [8]

A natural monopoly exists when one firm can supply the whole market at a lower

average cost than two or more firms, because fixed costs (factories, R&D) are

very high and marginal costs low, so LRAC falls over the whole range of market

demand. Fig. 2 suggests significant economies of scale: the cost per kWh falls by

more than half, from \$175 to \$80, as output rises from 5m to 38m between

2018 and 2030.

This could be a disadvantage. A profit-maximising monopolist produces where MC

= MR, at Qm and Pm in the diagram, so price is well above marginal cost. This

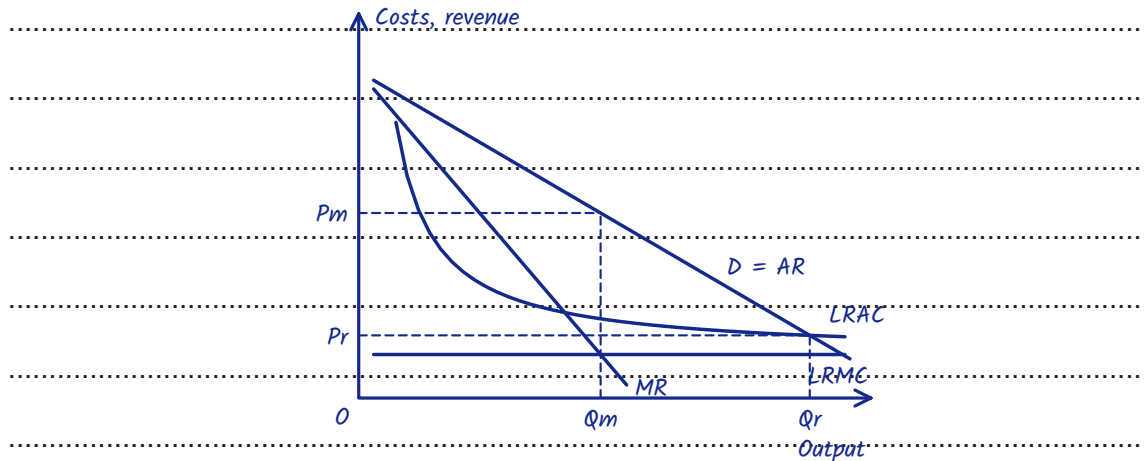
is allocatively inefficient, consumers lose surplus and battery-powered cars stay

expensive. The incumbent's economies of scale let it price any new entrant out of

the market, and with no competition product development may be slow and

X-inefficiency may arise. The government may then need regulation, which may be

costly and inefficient.

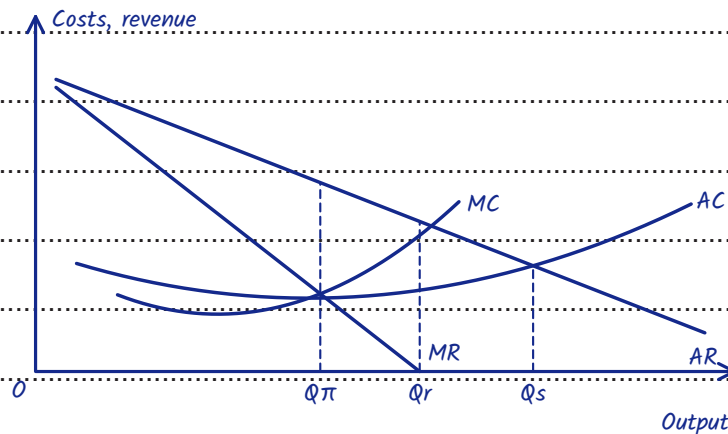


However, experts say battery cars can only be price competitive once batteries cost below \$100 per kWh, which Fig. 2 suggests is only reached after 2025 with the huge output a single large producer can achieve. Lower unit costs mean greater productive efficiency, and if they lead to lower prices the uptake of battery cars becomes more likely, helping the Road to Zero strategy. Regulators can also stop the firm raising price, e.g. average cost pricing (P_r , Q_r) gives normal profit and much higher output.

Overall, I judge that the gains in productive efficiency from such large economies of scale are likely to outweigh the losses from allocative inefficiency, so natural monopoly is only a serious disadvantage if it is left unregulated, which is a risk because battery production is a global market.

- (e)* Evaluate, using evidence from the stimulus material, the factors which may influence the choice of objectives for a firm such as Shell. [12]

Firms may pursue maximising objectives such as profit ($MC = MR$), sales revenue ($MR = 0$), sales volume ($AR = AC$), growth or managerial utility, or non-maximising objectives such as profit satisficing, social welfare and corporate social responsibility (CSR). As the diagram shows, each gives a different output.



π max: $MC = MR$; revenue max: $MR = 0$; sales max: $AR = AC$

One factor is ownership. Shell is a multinational plc with international shareholders who expect a return on their investment through annual dividends and a rising share price. This is best achieved by profit maximising at $Q\pi$, so the owners push Shell towards profit maximisation.

However, managers make the decisions, and Shell's managers have taken 'big decisions', buying an EV charging point company and a UK electricity and gas supplier. This investment reduces profits in the short run, so profit maximisation is less likely and long-run growth more likely. Due to the principal-agent problem, managers may also pursue their own utility, such as the status of running a bigger firm.

The market environment matters too. Shell is only the third largest fuel retailer, behind Tesco and BP, and the market is changing fast, with new petrol cars banned from 2030 and a third of vehicles possibly electric by 2040. To gain market share Shell may pursue growth or sales revenue objectives, such as installing hundreds more charging stations to take the lead in this growing market.

Government policy to reduce emissions, through new climate change targets, the Road to Zero strategy and possibly higher taxes on petrol cars, limits Shell's ability to profit or revenue maximise from oil and gas. Pressure groups such as climate change activists, who helped drive the switch to renewables, add to this, so Shell may adopt CSR objectives, e.g. a recharge service using 100% renewable energy.

Which factor has most influence is debatable. In such a large multinational, dispersed shareholders find it hard to control managers, so managerial objectives may have become more important. Given what Shell produces, CSR may be key as it embraces the green agenda. Yet ultimately profit is still the most important objective, because if Shell does not adapt to changing market conditions its profit will fall.

Overall, for a plc short-term issues may outweigh long-term ones, so some profit or growth is needed to keep shareholders on board. Managers are juggling the investment needed for the future (EV charging points) against shareholders' demands, so Shell is most likely to take a satisficing approach, with government policy the strongest influence as it is reshaping the whole energy market.

SECTION B

Answer **EITHER** Question 2 **OR** Question 3.

EITHER

- 2* In 2018, the French bank, BNP Paribas, was found guilty of eliminating competition and fixing prices with rival firms between 2011 and 2013. It was the sixth major bank to face criminal charges as part of the same investigation in the USA and agreed to pay a fine of \$90m.

Evaluate, using an appropriate diagram(s), whether such collusion is the most significant disadvantage of an oligopolistic market. [25]

OR

- 3* The education sector has the highest level of trade union membership in the UK, with over 50% of full-time teachers in a trade union. Approximately 90% of all teachers work in the state sector.

Evaluate, using an appropriate diagram(s), the impact of a bilateral monopoly on equilibrium in the labour market. [25]

Question ...2.....

..An oligopoly is a market dominated by a few large firms, with a high degree of.....
 ..market concentration, high barriers to entry, differentiated products and significant.....
 ..economies of scale. Firms are interdependent; each must take account of its rivals'.....
 ..behaviour and act strategically in reacting to, and anticipating, their decisions. This.....
 ..leads to non-price competition, price rigidity and a potential for collusion. Collusion.....
 ..occurs when firms act together to influence prices or output, preventing fair.....
 ..competition. It may be overt, such as the price fixing and market sharing agreements.....
 ..that the French bank and five other major banks faced criminal charges for, or tacit,.....
 ..such as price leadership and avoiding price competition.....
 ..By colluding, oligopolists can act like a single monopolist and maximise their joint.....
 ..profits. In Diagram 1 the colluding firms restrict output to Q_1 , where $MC = MR$, and.....
 ..raise price to P_1 , compared with P_c and Q_c under competition. Consumers pay higher.....
 ..prices, lose consumer surplus and have less choice, while firms earn supernormal profit.....
 ..(shaded). As $P_1 > MC$ there is allocative inefficiency and a deadweight welfare loss.....
 ..(hatched). In banking, fixed fees and interest rates mean households and firms pay.....

more for loans and financial services, raising costs throughout the economy. Game theory shows why firms collude. In Diagram 2, if both banks keep a high price each earns £8m, but if both compete with low prices each earns only £4m, so agreeing to keep prices high maximises joint profit. Collusion also reduces the pressure to cut costs, causing X-inefficiency, and the incentive to innovate, causing a loss of dynamic efficiency. It reinforces monopoly power, creating barriers to entry and lowering contestability, which is why the banks were prosecuted and fined \$90m.

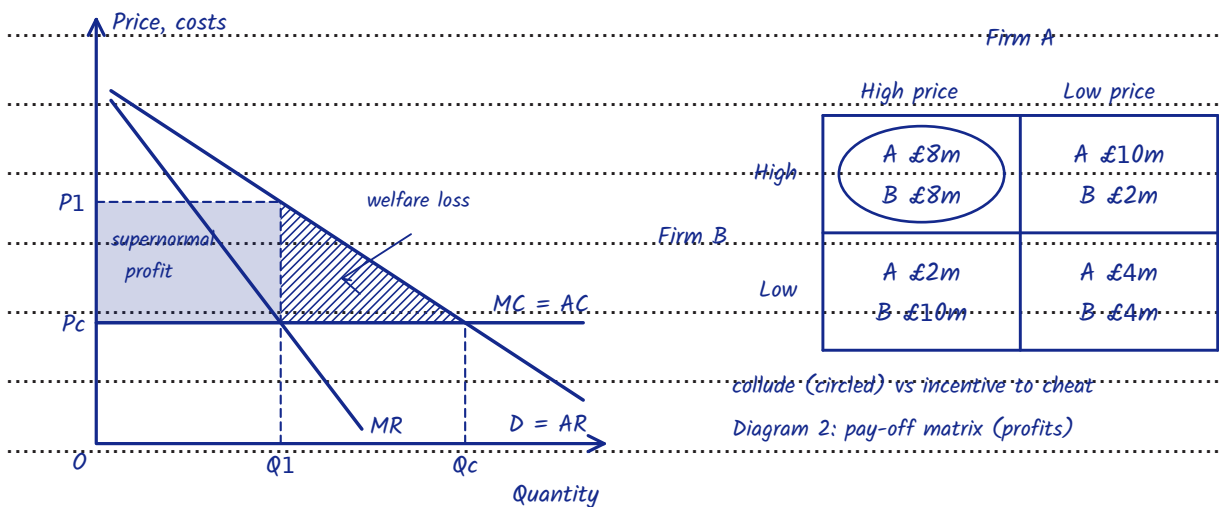


Diagram 2 shows each firm has an incentive to cheat: if Firm A cuts its price while B keeps a high price, A's profit rises from £8m to £10m, so low price is the dominant strategy and agreements tend to break down. Collusion is also illegal, and the Competition and Markets Authority (CMA) gives immunity from fines to firms that report their involvement in a cartel, so agreements are likely to be discovered, as these six banks were. Large fines and criminal charges act as a deterrent, so collusion may be short-lived.

Other features of oligopoly may be more significant disadvantages. Price wars are often started when one firm sees the opportunity to drive out a weaker competitor, which may lead to a near-monopoly position and reduce consumer choice; they may also be started by new entrants such as Aldi and Lidl. Prices fall in the short run but often

return to high or higher levels. Similarly, an incumbent may use limit pricing, charging a price below the average cost of potential entrants to prevent entry, then returning to the profit-maximising price. Consumers gain lower prices in the short run but have less choice in the long run. Price rigidity, explained by the kinked demand curve, can also keep prices high even when costs fall, and heavy spending on advertising and branding may waste resources.

The significance of collusion also depends on its type. Overt cartels like the banks' price fixing harm consumers directly, but tacit collusion is harder to prove and its effects may be smaller. Some cooperation may even be beneficial: joint research projects or technology swaps can lead to greater dynamic efficiency and lower unit costs, and higher profits may create welfare benefits if they are used for capital investment or higher wages.

In conclusion, collusion is a significant disadvantage because while it lasts it gives oligopolists the power of a monopolist, raising prices and reducing output, choice and efficiency, as the banking case shows. However, I do not think it is the most significant disadvantage, since cartels are unstable, illegal and increasingly detected and fined. Limit pricing and predatory price wars are legal, harder to regulate and can permanently remove competitors, so in the long run they may harm consumers more. Ultimately it depends on how effectively the CMA and other regulators detect collusion in each market.

SECTION C

Answer **EITHER** Question 4 **OR** Question 5.

EITHER

- 4* “A £1.4bn government bailout has been announced for Crossrail, as Europe’s biggest infrastructure project to build a new underground line across London is once again over budget and delayed. This is yet another example of a failed government-financed and managed project.”

Evaluate whether governments should finance large infrastructure projects such as Crossrail. [25]

OR

- 5* Supporters of a centrally planned economic system believe a central government can achieve social and national objectives more efficiently than a market economy. For example, they highlight the increase in income inequality in China since it has introduced market-based reforms.

Evaluate whether it is possible to allocate resources efficiently in a centrally planned economic system. [25]

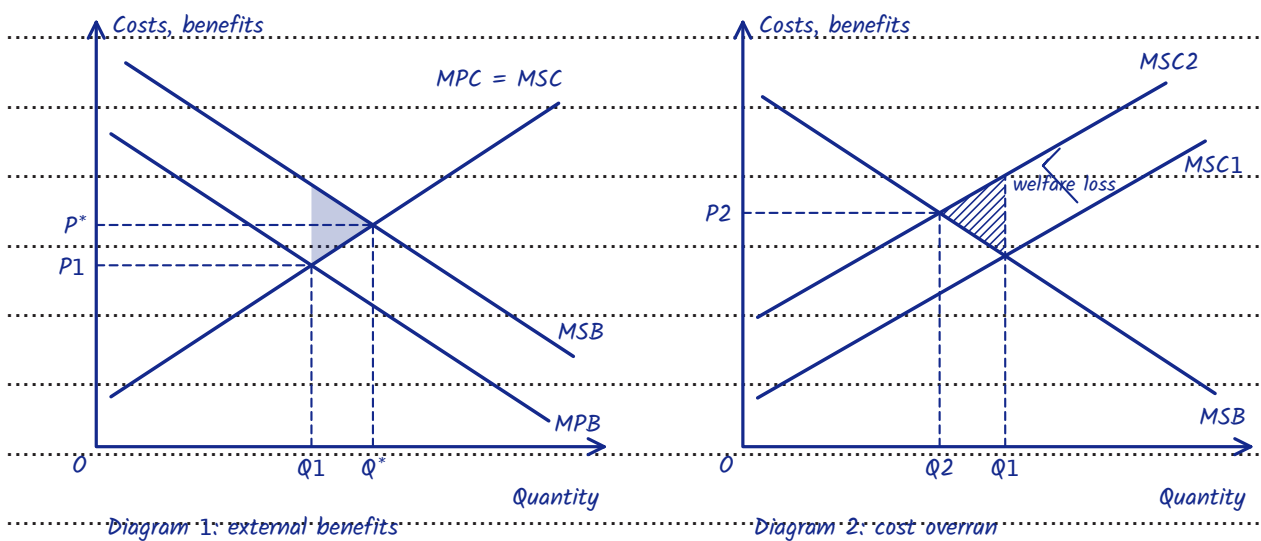
Question ...4.....

..Large infrastructure projects such as Crossrail, HS2 and Hinkley Point C involve huge.....
 ..capital costs and create both private and external costs and benefits. Whether.....
 ..governments should finance them depends on whether the market would provide them.....
 ..efficiently, or whether intervention would lead to government failure, where intervention.....
 ..causes a net welfare loss.....
 ..The private costs of large infrastructure projects are significant and occur over a long.....
 ..period of time. They include the acquisition of land and construction costs, they are.....
 ..subject to uncertainty and are always likely to be larger than expected, and they occur.....
 ..many years before the project delivers private benefits in the form of revenue. The.....
 ..government is better placed than the private sector to raise finance at lower rates of.....
 ..interest and to bear this risk, so without it many projects would not happen.....
 ..Large infrastructure projects also have significant external benefits for the local and.....
 ..national economy and for businesses. For Crossrail these include greater labour.....
 ..mobility, as workers can cross London more quickly, less congestion and higher.....

productivity. The private sector ignores these, since $PMB < PMC$ at higher outputs, so in Diagram 1 the market provides only Q_1 , where $MPB = MPC$, below the social optimum Q^* where $MSB = MSC$, causing a welfare loss (shaded). Government finance raises output to Q^* .

Some projects are public goods, such as flood defences like the Thames Barrier, which are non-excludable and non-rivalrous. They suffer from the free-rider problem, so the private sector would not finance them at all because it could not charge for them.

Projects also involve external costs, such as construction noise, traffic disruption, dust and poor air quality, compulsory purchase of land and property, and the impact on water resources, so $SMC > PMC$. Governments are best placed to balance social costs against social benefits, e.g. using cost-benefit analysis, in deciding on and financing these projects.



However, government financing of large infrastructure projects is often subject to cost overruns. Crossrail has had to be bailed out with an additional £1.4bn and is once again over budget and delayed. In Diagram 2, if the true social cost rises from MSC_1 to MSC_2 but the government still builds Q_1 , the SMC is greater than the SMB beyond Q_2 , giving a welfare loss (hatched): government failure. Without the profit motive, and under political pressure, cost control is often weak. The private and external benefits are also difficult to estimate, as is future revenue, so governments

may have to finance such projects on an ongoing basis.
Government finance also adds to the national debt. Paying the interest on this debt involves an opportunity cost, as the money could have been spent on schools or the NHS, and taxpayers across the whole country pay for infrastructure that mainly benefits London.
On balance, governments should finance large infrastructure projects where there are clear and significant external benefits and where the private sector cannot, such as public goods: governments fund 100% of flood defences because private benefits cannot be monetised. Where private benefits can be monetised, the private sector should finance at least part of the project: power stations can be privately financed, and Crossrail can be part-financed by a levy on businesses and by fares. The bailout shows poor project management rather than proof that government finance is wrong, so the best approach is shared financing with strict cost controls to reduce the risk of government failure.

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ADDITIONAL ANSWER SPACE

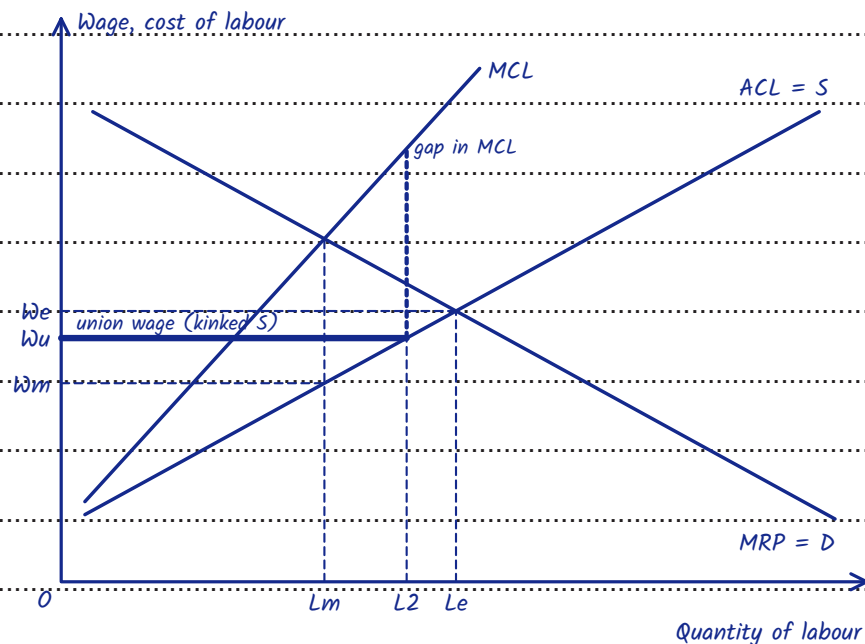
If additional space is required, you should use the following lined page(s). The question number(s) must be clearly shown in the margin(s).

3

A bilateral monopoly exists when a monopoly seller of labour, typically a trade union where union density is high, faces a monopsony buyer of labour, a single dominant employer. Teaching is a clear example: over 50% of full-time teachers belong to a trade union, giving the union significant monopoly power, while about 90% of teachers work in the state sector, so the government is effectively a monopsony employer.

In a competitive labour market, equilibrium is where the supply of labour (ACL) equals the demand for labour (MRP), giving wage w_e and employment L_e . A monopsonist, however, must raise the wage for all its workers to attract one more, so its marginal cost of labour (MCL) lies above the supply curve. It employs labour up to the point where $MCL = MRP$, so in the diagram it hires only L_m workers and pays wage w_m , read off the supply curve, which is below the free market wage w_e . Both wages and employment are lower than in a competitive market.

If the trade union is powerful enough, as in teaching, it can negotiate an agreed pay rate w_u , below which the employer is not allowed to pay. This makes the labour supply curve kinked: horizontal at w_u up to L_2 , where it meets ACL, and then following ACL. This produces a discontinuity (vertical gap) in the MCL curve at L_2 . Up to L_2 the cost of an extra worker is just w_u , so the monopsonist has an incentive to employ extra workers as long as MRP is greater than MC. It will therefore employ L_2 workers at wage w_u .



monopsony: W_m , L_m ; bilateral monopoly: W_u , L_2

Therefore the presence of a trade union forces the monopsony employer to hire more workers at a higher wage rate, both of which are closer to the perfectly competitive levels where $S = D$. If the union sets W_u equal to W_e it can achieve the competitive outcome exactly. So a trade union can increase both wages and employment compared with a monopsonistic labour market, unlike a union in a competitive market, where a wage above equilibrium causes unemployment.

However, the impact on equilibrium depends on several factors. The first is the level of union density and militancy: teaching or railway unions are more powerful than unions representing shop workers, so in low-density sectors the employer keeps the wage close to W_m . Second, if the union pushes the wage above the level where the kinked supply curve meets MRP, employment falls below L_m and unemployment results, so the outcome depends on how far wages are raised. Third, the demand curve for labour matters: if the demand for labour is relatively inelastic, as for teachers since education is compulsory and there are few substitutes, any increase in wage rates will have less of an impact on employment.

The employer's profits also matter. A union is unlikely to strike for higher wages

if a firm is not profitable, while firms making large profits, or where profit is rising, are prone to demands for higher wages. In the state sector teachers' pay depends on government budgets rather than profit, so limits on public spending may cap pay rises whatever the union's power. Nowadays unions are also more likely to focus on wider working conditions, such as workload and class sizes, rather than wage levels alone.

In conclusion, in theory a bilateral monopoly moves the labour market closer to the competitive equilibrium, raising both wages and employment compared with monopsony. However, ultimately it is impossible to predict exactly where the market will end up, as the wage is indeterminate between W_m and the MRP at L_m : it will depend on the relative strengths and negotiating skills of the employer and the union. In teaching, high union density makes the union relatively strong, but given the long-term decline in union membership, it may well be that the employer has the upper hand in many other industries.

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5

Resource allocation involves choices about how to deploy society's scarce resources across their different uses: what to produce, how to produce it and for whom. In a centrally planned (command) economy most resources are allocated by the state, with the market mechanism having no or a very small part to play. The government owns most or all industries, closely directs any private firms, decides what to produce through 5 or 10 year plans and sets prices or directly rations goods, as in the Soviet Union from 1917 to 1991, China until the late 1970s, Cuba and North Korea.

Resources are allocated efficiently when there is allocative efficiency, producing the combination of goods society values most ($P = MC$), and productive efficiency, producing at the lowest possible average cost, at a point on the production possibility frontier (PPF).

Supporters argue the state can produce the 'right' goods and services. As the price mechanism does not allocate resources, there is no market failure: the state decides the right amount of the goods that maximise social benefit and minimise social cost, so merit goods such as healthcare and education are not under-provided. In Diagram 1 planners can choose point A on the PPF to meet national objectives, such as investment in capital goods.

Resources may also be used more efficiently. Instead of using resources for the same product made by different companies, there is one state-owned enterprise which can exploit economies of scale, and resources are not diverted to wasteful marketing and promotion. Rent seeking, using resources to gain profit without providing benefits to society, is reduced: in market economies firms lobby governments for subsidies and looser regulation, which wastes scarce resources.

Resource allocation may also better reflect needs. The government dictates prices, so consumers are not priced out by market prices that may reflect market power rather than scarcity, and prices are set at a level where the

average consumer can afford what they need. Inequality of income and wealth is much lower than in a free market because private ownership of resources is removed and incomes are decided by the state, so what is produced and for whom is not distorted by the spending of the rich. The rise in income inequality in China since its market-based reforms supports this view.

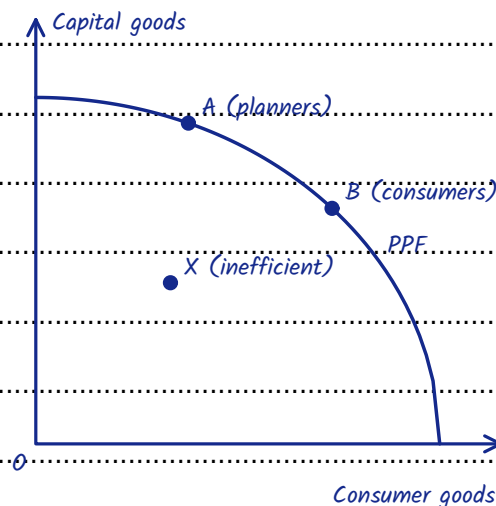


Diagram 1

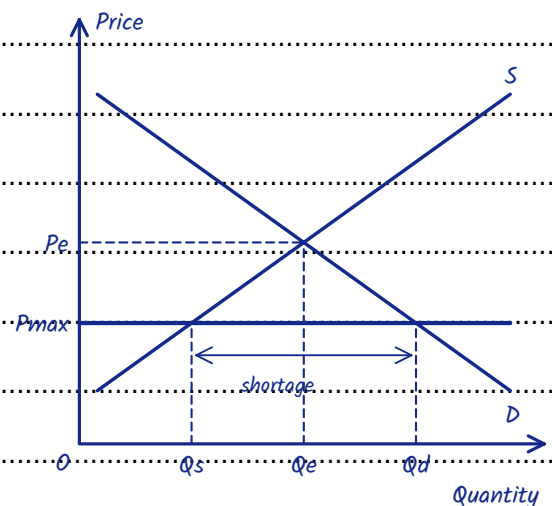


Diagram 2: state-set price

However, in practice central planning tends to allocate resources inefficiently. The absence of the profit motive results in X-inefficiency and the absence of competition results in productive inefficiency, so output is at a point such as X inside the PPF in Diagram 1. Most importantly, the absence of a price mechanism results in allocative inefficiency: consumers are unable to express their preferences, so planners lack the information to choose point B, the mix consumers want. As Diagram 2 shows, when the state sets a price P_{max} below the market-clearing price P_e , quantity demanded Q_d exceeds quantity supplied Q_s , so goods are rationed by persistent shortages and queues. Command economies typically produce inferior quality consumer goods at a higher cost, and rent seeking still exists in favour of the ruling elites.

The evidence supports this. Centrally planned countries such as North Korea and Cuba are towards the bottom end of international measures of output and prosperity, suggesting large inefficiencies in resource allocation, and the command

economy approach has been abandoned in Eastern Europe, Russia and China.

Although income inequality in China has risen, living standards have risen and poverty has fallen sharply since its market reforms, suggesting a major improvement in resource allocation.

In conclusion, it is possible in theory for a central planner to allocate resources efficiently, and planning can achieve some social and national objectives, such as greater equality or rapid industrialisation, more effectively than markets. However, the information problem means efficient allocation is extremely unlikely in practice for a modern economy producing millions of different goods. Resources are most likely to be allocated efficiently in a mixed economy, where markets allocate most resources and the state corrects market failures and reduces inequality, which is the path China has taken.