NJC 2024 SH2 H1 Econs P1 Suggested Answers

Case Study Question 1

Suggested Answers

(a) With reference to Extract 1 and using Price Elasticity of Demand (PED), explain the impact on consumers' food expenditure as a result of the climate change. [4]

- Climate change has destroyed food crops. Thus, the supply of food has decreased. **[1]**
- The decrease in supply of food would cause an increase in the price of food. **[1]**
- Food has high degree of necessity. Therefore, |PED| < 1. **[1]**
- Given |PED| < 1, the increase in price of food would cause an increase in consumer expenditure on food. **[1]**

(b) With reference to Extract 1, explain the reason for the increase in consumption for animal-based proteins in developing countries. [2]

- In developing countries, animal-based proteins are considered normal goods. **[1]**
- When there is economic growth, households have higher income thus there is an increase in demand for animal-based proteins. **[1]**

(c) With reference to Extract 2, explain why there is "a downward trend in meat-eating but figures are still high" (Extract 2). [4]

- "The recent development of plant-based meat" (Extract 2) led to a decrease in the prices of plant-based meat. **[1]**
- Plant-based meat is considered substitute in consumption to meat. **[1]**
- When prices of plant-based meat decrease, there is a decrease in demand for meat, hence explaining the downward trend. **[1]**
- Nevertheless, "the figures are still high" because there is a lack of / weak public support (Extract 2) due to "cultural habits" (Extract 2), thus the decrease in demand is insignificant. **[1]**

(d) With reference to Extract 3,

(i) and using a demand and supply diagram, explain how the Environmental Land Management Schemes (ELMS) boost UK farmers' income as a result of doing the right thing for the environment. [4]

- "Do the right thing for the environment, for example looking after hedgerows, grasslands and soils / large-scale rewilding projects / natural flood management, wetland restoration and enhancing forest (Extract 3), would increase the cost of food production to UK's farmers. The increase in cost of production would reduce the income of UK's farmer. **[1]**
- Government payments via the ELMS help lower the cost of food production when the farmers adhere to the higher environmental standards. This would increase the production of food as illustrated by the shift of the supply curve from So to S1 in Diagram 2. **[1]**

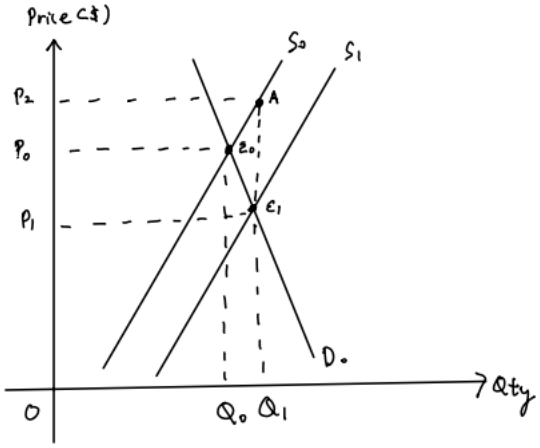

Diagram 2: The market for farmed goods

- As a result, no doubt UK's farmer pre-subsidy revenue decreases from area $P_0E_0Q_00$ to area $P_1E_1Q_10$, UK's farmer post-subsidy revenue increases from area $P_0E_0Q_00$ to area ($P_1E_1Q_10 + P_0E_0AP_2$). **[1]**
- A well-labelled and well-referred to diagram. **[1]**

(ii) explain the unintended consequence of UK's higher environment standards in food production on its economy. [2]

- UK's higher environment standards in food production would increase the cost of food production to UK's farmers and the farmers would pass on the higher costs in terms of higher prices to consumers. **[1]**
- UK's consumers would thus switch from purchasing the relatively more expensive domestically produced food to the relatively cheaper imported food thus increasing UK's import expenditure (M) and hence decreases UK's (X-M). **[1]**

(e) Using a demand and supply diagram, explain and comment on the likely effects of the decrease in demand for meat (Extract 2) and the subsidies for livestock farming (Extract 4) on the quantity of meat transacted in UK. [6]

- The subsidies for livestock farming in UK would reduce the cost of production for UK's livestock farmers and thus increase the supply of livestock in UK.
- Given that the "UK government spends at least £1.5b a year subsidising livestock farming", the increase in supply due to the subsidies is large.
- The large increase in supply of livestock would put a large downward pressure on the price of livestock in UK.
- The significantly lower price of livestock would significantly lower the cost of meat production in UK and thus lead to a large increase in the supply of meat in UK's meat market as illustrated by a large shift of the supply curve from S0 to S1 in Diagram 2.
- A well-labelled and well-referred to diagram.

- As explained in (c), the demand for meat in UK has decreased but the decrease is small. This is illustrated by a small shift of the demand curve from D0 to D1.

- Given the increase in supply is larger than the decrease in demand, quantity transacted of meat in UK would increase.

(f) With reference to the information provided, discuss the view that providing information would reduce allocative inefficiency caused by imperfect information on "the demand side" (Extract 4) of UK's food systems. [8]

- The existence of imperfect information regarding the health costs arising from obesity due to meat-eating (Extract 2) has resulted in allocative inefficiency on the demand side of UK's food system.
- As a result of the imperfect information regarding the heath costs, consumers underestimated their private cost of meat-eating. For example, obesity and its related health issues that would require expensive medical treatments.
- The existence of the imperfect information thus results in a divergence between $MPC_{perceived}$ and MPC_{actual} as illustrated in Diagram 2 where $MPC_{actual} > MPC_{perceived}$.

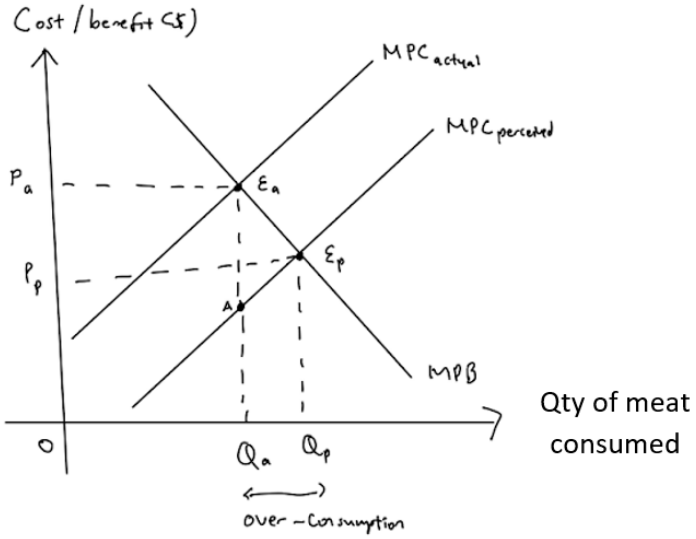

Diagram 2: Costs and benefits of meat-eating from consumers perspective

- The free-market equilibrium level of consumption is at Q_p where $MPC_{perceived}$=MPB but the socially optimal level of consumption is at Q_a where MPC_{actual}=MPB. The latter assumed the inexistence of externalities thus MPC=MSC because MEC=0 and MPB=MSB because MEB=0.
- Since $Q_a<Q_p$, there is an over-consumption of meat by Q_aQ_p.
- The over-consumption results in allocative inefficiency illustrated by a deadweight loss of triangle E_aE_pA.

- Information providing regarding the true full costs of meat-eating (e.g. health costs such as obesity and its related health issues that would require expensive medical treatments), if successful, will change consumers' taste and preferences away from eating meat (i.e. decrease in demand for meat) and towards more plant-based alternatives because of the increase in their marginal private cost of meat-eating as illustrated by the shift of $MPC_{perceived}$ closer to MPC_{actual}.
- As a result, meat-eating would reduce from Q_p towards Q_a, decreasing the over-consumption thus reducing the deadweight loss. Therefore, information providing can be used to reduce allocative inefficiency caused by imperfect information on the demand side of UK's food systems.

- In conclusion, whether information providing would reduce the allocative inefficiency caused by imperfect information on the demand side of UK's food system depends on the nature of information provided.
- Information must be targeted at how meat-eating would impact the individuals themselves (e.g. health costs arising from obesity) to be effective (also suggested in Extract 4 Paragraph 5).

(g) With reference to the information provided, discuss whether a reduction in subsidies given to high-emission food production should be implemented by the UK government to address the market failure on "the supply side" (Extract 4) of UK's food systems. [10]

- No doubt the reduction in subsidies given to high-emission food production can address the market failure on the supply side of UK's food system, it will bring about unintended consequences.
- Whether the UK should reduce the subsides on high-emission food depends on whether the subsidies can be reoriented to low-emission food production to minimise the unintended consequences.

- Negative production externalities in the case of, for example meat (i.e. animal-based proteins) production, are spill over costs associated with meat production to third parties who are not directly involved in the production nor consumption of meat, and no compensation is involved.
- Meat production have private benefits to firms such the revenue earned from the sale of meat and private costs to firms such as wage expenditure to process / transport the meat and the expenditure on animal feeds.
- However, meat production also has external costs to third parties such as vegetarian rising from health-related illnesses (and their treatments) associated with greenhouse gas emissions (Extract 1) such as heat stress and elevated blood pressure
- Meat is often over-produced resulting in deadweight loss because the external costs are not internalised by meat producers who care only about their private benefits and costs.
- The private benefits and the private costs can be illustrated by MPB and MPC in Diagram 3 respectively.

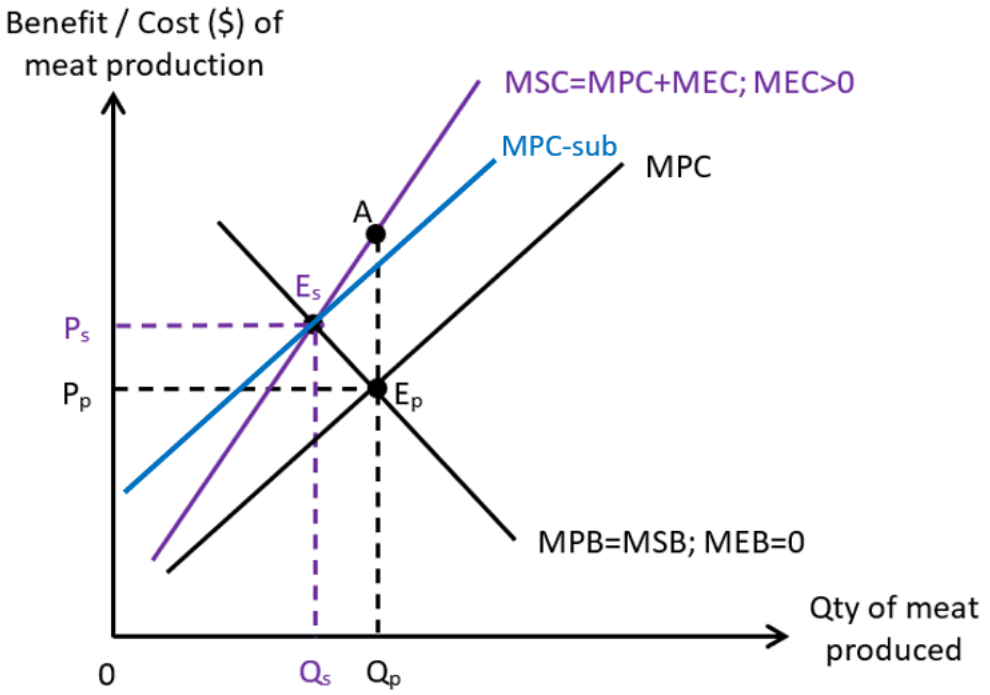

Diagram 3: Negative externalities from meat production

- The private production level is achieved at E_p where MPB=MPC with production level Q_p and price P_p.
- The existence of external costs results in a divergence between MPC and MSC by the amount MEC because the individuals fail to internalise the external costs.
- Assuming no external benefit and hence MEB=0, MPB=MSB. Social optimality is achieved at E_s where MSB=MSC with production level Q_s and price P_s.
- Since $Q_s<Q_p$, there is an over-production of meat by Q_sQ_p.
- The over-production due to negative externalities results in allocative inefficiency illustrated by a deadweight loss of triangle E_sAE_p.

- A reduction in production subsidies for livestock farming (Extract 4) would increase the private cost of meat producers, thus the private cost would increase by the value of the marginal external cost as illustrated from MPC to MPC-Sub.
- As a result, meat production would reduce from Q_p to social optimal level Q_s, eliminating the deadweight loss.

- However, the reduction in subsidies on meat production would worsen UK's cost of living crisis as mentioned in Extract 4 because it would lead to higher price for meat as illustrated from P_p to P_s in diagram 3. Given that UK is a western country with strong meat eating cultural habits (Extract 2) thus expenditure on meat takes up a large proportion of UK residents' living expenditure, the increase in consumption expenditure on meat would contribute a significant increase in their cost of living. Assuming income nominal unchanged per capita (assuming population size remain the same), the reduction in the subsidies would lower UK's material standard of living as lesser needs and wants can be met. That explains why "measures need to consider potential impacts on food prices …. " (Extract 4).

- Furthermore, the increase in price of meat produced in UK (due to the reduction on subsides on meat production) would lead to a loss of price competitiveness of meat produced in UK. With reference to answer in c(ii), the relatively higher price would cause UK's consumers to switch from purchasing the relatively more expensive domestically produced food to the relatively cheaper imported food thus increasing UK's import expenditure (M) and hence decreases UK's balance of trade (X-M) surplus / increases UK's balance of trade (X-M) deficit, leading to the unintended consequence on UK's economy mentioned in Extract 3.

- In addition, the reduction on subsidies on meat production would damage the domestic livestock farming sector, risking the livelihood of the farmers (Extract 2; similar to that of having a meat tax on production). This is because with the reduction in subsidies, meat producers (including livestock farmers) would now have to pay for that part of the cost previously covered by the subsides and thus increase their cost of production. Given Profit = Total revenue - Total cost, profit and thus income of meat producers would decrease, assuming total revenue unchanged. That explains why "measures need to consider potential impacts on … producer incomes" (Extract 4).

- In conclusion, no doubt a reduction in subsidies given to high-emission food production could reduce allocation inefficiency thus address the market failure on the supply side of UK's food systems, it can have unintended consequences on UK's cost of living / UK's balance of trade / livelihood of UK's food farmers.
- Whether the reduction in subsidies should be implemented depends on whether the subsidies can be / are reoriented to low-emission food production.