2024 H1 EOY Exams – Micro Case Study

Suggested Answers

(a)	**With reference to Figure 1, compare China's domestic and international passenger traffic recovery (to 2019 levels) for the period between January 2020 and January 2024. [3]**	
	• Domestic passenger traffic fluctuated widely between February 2020 and January 2023 while international passenger traffic showed little or no change till after January 2023. **[1]** • Both domestic and international passenger traffic began to recover around January 2023. **[1]** • Domestic passenger traffic experiences complete recovery to 2019 levels by April 2023 but international passenger traffic did not recover to 2019 levels at all. **[1]** • Overall, domestic passenger traffic increased slightly while international passenger traffic decreased by about 42 % compared to 2019 levels. **[1]** Any three points for 3 marks.	
(b)	**(i)** **Explain the opportunity cost of Chinese government subsidies to the tourism industry. [2]**	
	• Opportunity cost is the next best alternative forgone. **[1]** • Extract 1 says that subsidies to tourism cost China over 500 billion dollars. • This money could have been better used in an alternative area such as healthcare for its citizens. **[1]**	
	(ii) **Using a Production Possibility Curve diagram, explain two benefits of the sharp increase in domestic tourism in China. [5]**	
	• Due to covid19 lockdowns, the Chinese economy is operating inside PPC_1, at point A in Figure 1 below, implying unemployed and underemployed resource utilization. • With a sharp increase in domestic tourism, as evidenced in extracts 1 & 3, this situation will be reversed leading to better resource utilization. **[1]** The economy moves from operating inside the PPC to the boundary of PPC_1, at point B, representing actual growth. **[1]** • In addition, more investments may improve the quantity and quality of capital goods in the economy enhancing the productive capacity. Extracts 1 & 3 suggest improvements to infrastructure such as rail and air networks as well as innovations arising in the industry. **[1]** As a result the entire curve shifts outwards to PPC_2, and the possibility of operating at point C, representing potential growth. **[1]** • Clearly labelled, correct diagram. **[1]**	

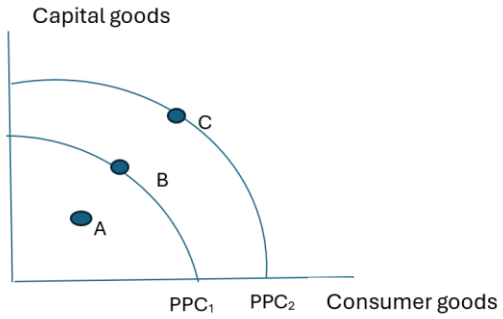


Figure 1: PPC for China

(c) (i) Using information from Extracts 1 & 3, identify and explain one demand factor and one supply factor that contributed to recovery of the domestic airline market in China. [4]

- Demand factor – Demand increasing, shifting rightwards (**Any 1**, well elaborated)
  - Taste and preference (extract 3)
    - Renaissance of domestic tourism
    - Pent-up travel demand
    - CNY family reunions
  - Substitutes (extract 3)
    - High-speed rail alternative is costlier
  - Income (extract 3)
    - Lowered income due to economy not doing well, high youth unemployment etc, therefore overseas travel not a preferred option
  - Government policy (extract 3)
    - Covid19 travel restrictions for overseas travel
- Any of the above demand factors will cause the demand for domestic airline services to rise and shift to the right. **[2]**

- Supply factor - Supply increasing, shifting rightwards (**Any 1**, well elaborated)
  - Lowered unit cost of production
    - Subsidies provided by government (extract 1)
    - Use of widebody aircraft (extract 3) enables airlines to carry more passengers per flight
  - Upgrading of airports, technological innovations (extract 1)
    - Increases the airports' capacity enabling more flights to operate
- Any of the above supply factors will cause the supply of domestic airline services to increase and shift to the right. **[2]**

- With both demand and supply increasing, the quantity traded will increase, thus, contributing to the recovery of the domestic airline market in China.

(ii) Using price elasticity of demand, explain how 'the inevitable rising costs due to capacity building activities' **(Extract 3)** is likely to affect total revenue on domestic air travel in China. [4]

- The combination of the PED for domestic air travel and changes to supply caused by rising costs are likely to affect the total revenue of domestic air travel in China.

- PED for domestic air travel **[1]**
  - Domestic air travel is seen as a service with a high degree of **necessity**, due to pent-up demand, CNY reunions.
  - Alternatives like high-speed rail is more expensive, therefore contributing to a low number of substitutes.
  - Demand for domestic air travel is therefore, likely to be **price inelastic**, with values <1

- Changes to Supply **[1]**
  - Revival of domestic travel sector likely to use up all spare capacity
  - Purchase or leasing of more airplanes to increase capacity is 'a very expensive affair' (extract 3)
  - Thus, the costs of production will inevitably rise
  - Supply is reduced, shifting leftwards

- The effect as shown in diagram below will raise prices to P_1
- Given that the demand for domestic air travel is price inelastic, the rise in price leads to a smaller proportionate fall in quantity demanded **[1]**
- Total revenue is price x quantity. Therefore, while area B is lost, there is an overall net gain as area A is larger. Hence, the total revenue of domestic air travel will increase. **[1]**

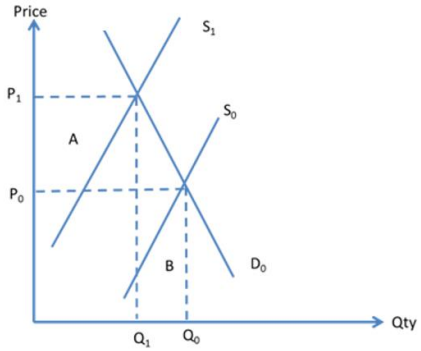


Figure 2: Total Revenue on domestic air travel in China

(d)	**(i)**	**With the use of a diagram, explain how the market for air travel fails.**	**[4]**

The market for air travel is failing due to **negative externalities**. These are third party costs incurred by those not directly involved in the economic transactions of the air travel industry and are not compensated for the effects. **[1]**

<u>Explain how market fails due to negative externalities</u>
Air travel generates negative externalities in terms of the damage to the environment. Carbon emissions from flights are extremely high and it contributes to air pollution and global warming (Extract 5). This process hastens climate change and causes third party effects.

Such negative externalities cause a divergence between marginal social cost (MSC) and marginal private cost (MPC) as MSC = MPC + marginal external cost (MEC).

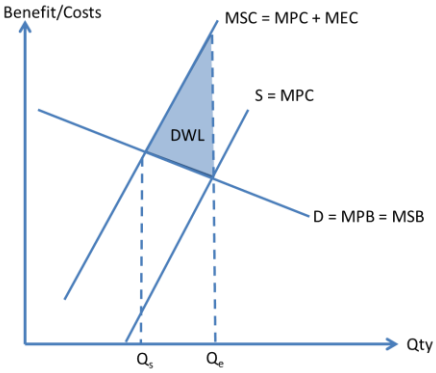


Figure 3: Negative externalities arising from air travel

In the diagram **[1]** above, the market equilibrium would be at Q_e where MPB = MPC as consumers and producers of air travel are self-interested and do not consider external costs. However, the socially optimal output is at Qs where MSB = MSC. Since Q_e exceeds Q_s, there is overproduction / overconsumption of air travel. **[1]** This causes a deadweight loss of the shaded area as MSC exceeds MSB for the output between Q_s and Q_e. **[1]**

Hence, the market for air travel fails due to allocative inefficiency, warranting government intervention to reduce consumption level to Qs.

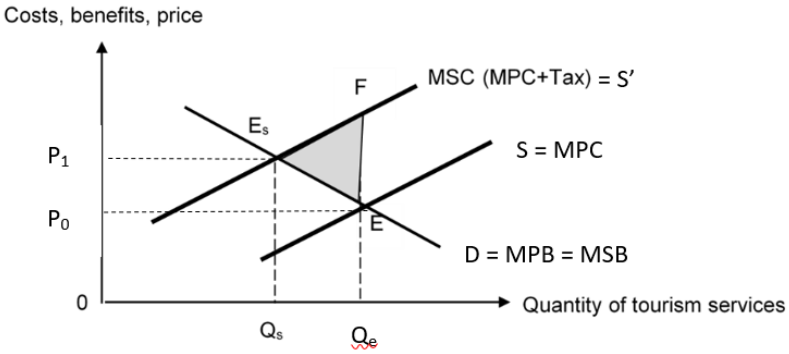
	(ii)	**Discuss the appropriate policies a government could adopt to overcome the carbon intensive nature of air travel and achieve an efficient allocation of resources in this market.**	**[10]**

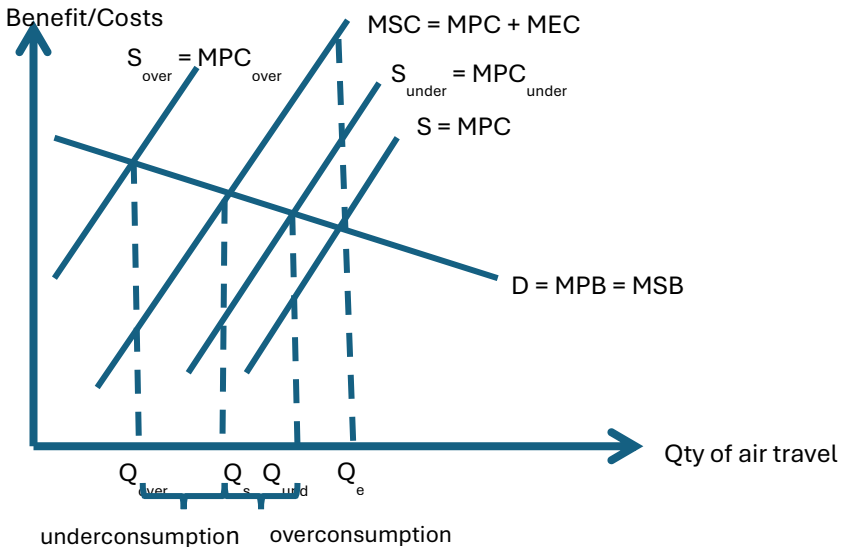
Question Analysis
Command word: Discuss, two sided with evaluative conclusion
Content: microeconomic policies to overcome the negative externality and achieve allocative efficiency; impose taxation, greater adoption of the SAF and R & D, etc
Context: Any government; both domestic and international air travel can be discussed.
Analysis: R1 + R2

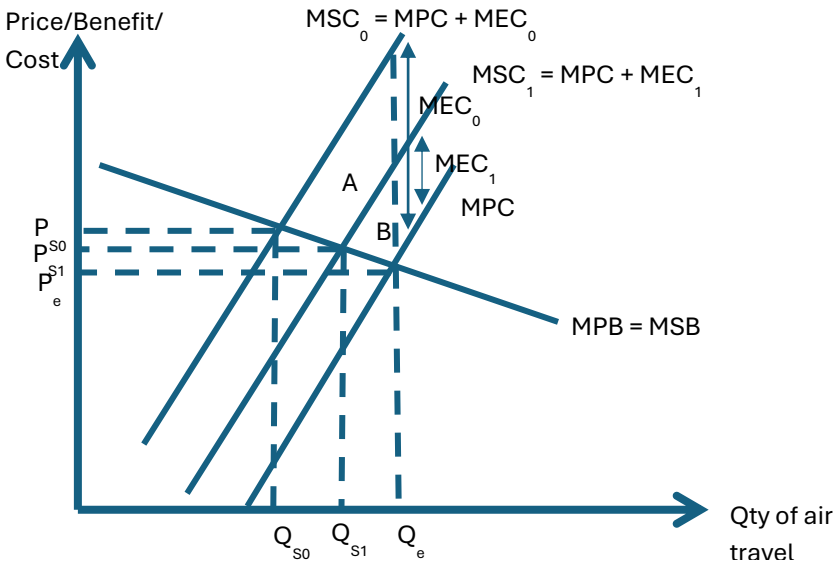
R1: Government **could adopt taxation** to overcome the carbon intensive nature of air travel and achieve an efficient allocation of resources in the air travel market.

R2: Government **could adopt R&D and greater adoption of the SAF** to overcome the carbon intensive nature of air travel and achieve an efficient allocation of resources in the air travel market.

Evaluative conclusion: Due to limitations of each policy, an approach that combines policies will be appropriate. Time frame (SR vs LR), alternative forms of transport, as well as the inequitable nature of carbon pollution mentioned in extract 6 also needs to be considered to achieve an efficient allocation of resources.

Introduction	Given the generation of negative externalities arising from air travel, a government must consider the implementation of policies to mitigate the negative effects. Key among these policies is imposing taxation and the greater adoption of the SAF through R & D. Besides these, governments should be able to complement other policies as needed.
Requirement 1: **Taxation**	As shown in **part d) i)** above, air travel generates negative externalities, implying an overconsumption of air travel in the country. As such, the government may impose an indirect tax on all air travel expenditure to cut back consumption to a socially optimum output level to achieve allocative efficiency. The ideal way is to remove the marginal external cost shown in figure 3 above. When done effectively, through taxation, both the overconsumption and the deadweight loss is eliminated.  Figure 4: Taxes to eliminate negative externality When the government imposes an indirect tax on air travel expenditure equal to the marginal external cost, which is the monetary valuation of the harm imposed on society due to the negative externality, we say that the tax internalizes the external cost as producers now must pay this tax whereas previously, they just ignored the external cost. This raises the firm's marginal private cost (i.e. cost of production will increase) and the supply curve will shift to the left to S' (MPC is raised to MPC + tax, which is equal to the MSC) in the figure above. Price of air travel services rises from P_0 to P_1, and quantity traded of tourism services falls from Q_e to Q_s. Fewer air travel in the country means lesser negative externality generated. At this equilibrium, MSB=MSC. The overconsumption is corrected. This eliminates the deadweight loss, achieving allocative efficiency. With greater tax revenue collected through tax, the revenue obtained could be channeled towards building infrastructural facilities to produce environment friendly jet fuel such as the SAF or subsidize the building and operation of ecologically friendlier modes of travel like the high-speed rail. Thus, the externalities created by conventional air travel can be corrected using tax revenue collected. In this manner, the efficiency in resource allocation outcome can be sustained. Hence, an indirect tax

		on all air travel expenditure is the best way for governments to minimize the negative externalities arising from air travel.
	Limitations	However, it is difficult to assess the monetary value of the MEC. It is not easy to put a dollar value to how much negative externalities are generated by air travel. If the government assesses the amount wrongly due to imperfect information, the tax imposed may be too high or too low. For example, if the MEC is overestimated, the government would levy taxes that are too high. This would result in underconsumption of air travel. Conversely, if the MEC is underestimated, the government would levy taxes that are too low, resulting in air travel still being overconsumed. Hence, indirect tax may not be the best way to minimize effects of negative externalities from increased air travel.  Figure 5: Over and under taxation Moreover, there are trade-offs of lower employment and economic growth. Imposing an indirect tax to reduce the number of air travelers can result in a fall in revenue for the tourism industry. Such an event can lead to a detrimental macroeconomic impact by decreasing aggregate demand which then reduces the country's employment and real national output since production of goods and services is reduced. An indirect tax on all tourist expenditure is a blunt instrument as it does not differentiate between the different types of air travel. Social welfare will not be maximized if the tax discourages essential travel needs such as those for medical or familial reasons. There is also eco-tourism that creates positive externalities as it helps to promote conservation of natural resources. An indirect tax on such tourism will lead to a fall in the quantity traded and hence an under-consumption of the eco-tourism results and social welfare is not maximized.

	Requirement 2: **Adoption of the SAF through greater R & D**	As extract 5 suggests, the SAF is a much more efficient fuel compared to conventional jet fuel which is highly polluting. Even in its current usage, where it is blended with jet fuel the carbon emissions are reduced significantly. Therefore, governments should encourage the adoption of the SAF through legislation or even by subsidising its usage. Extract 5 also suggests that in its neat form, SAF reduce emissions by up 80 percent compared with jet fuel. This suggests that greater positive value will accrue to society if R & D is channelled to allow effective adoption of the pure SAF. Even if the same quantity of flights is maintained, the carbon emissions may be reduced by up to 80 percent which will improve allocative efficiency immensely by reducing deadweight loss. In figure 6, the original deadweight loss is A + B. With effective policies the deadweight loss is now reduced to just B, while quantity is raised.  Figure 6: Impact of legislation / R & D
	Limitations	As SAF is quite new in the market, its effectiveness, especially for long distance flights will need to be verified over time and more airlines must be forthcoming to adopt it. Currently the user base seems rather limited but only time will tell if companies like Shell Aviation can expand their clientele beyond players like SIA and RSAF. Another potential issue is that SAF is a biofuel as waste products and feedstocks are used in its production. Though extract 5 claims that the feedstock is sustainable, problems like climate change may reduce production of feedstock such as corn or sugar cane and this could potentially create new food crises. Finally, R & D faces the perennial issue of high development costs while successful implementation always remains a doubt. Private producers and governments may remain sceptical over SAF's long term success.

Evaluative conclusion	Taxation, if correctly assessed, appears to be an effective way of achieving allocative efficiency quickly. Thus, as a short run measure it offers great value. However, restricting air travel through such a measure may be a blunt measure that does not resolve the root cause of the problem. On the other hand, if a country relies heavily on air travel and tourism to support its economy the taxation policy may backfire and have negative impact on its macroeconomy and overall standards of living. Instead, while governments may adopt taxation as a short run measure, they must be prepared to supplement long run measures such as R & D and adoption of alternative fuels like the SAF. Besides this measure governments can also consider greener, faster modes of transport such as high-speed rail. Finally, governments should be cognizant of what was revealed in extract 6. The wealthiest create the lion's share of the carbon emissions and not paying attention to the way this group travels will defeat whatever actions are imposed the visible majority.

Level	Descriptors	Marks
L2	• Answer provides a **detailed and balanced response** of how at least two different policies act to overcome the negative externality caused by carbon pollution and achieve allocative efficiency • Makes use of data and contextual evidence.	**4-7**
L1	• One-sided answer focussing on a single policy *or* • Answer shows some understanding and knowledge of policies but is lacking in economic analysis • No use of data or contextual evidence.	**1-3**
E2	For an evaluative comment that builds on prior analysis.	**2-3**
E1	For an unexplained / unsupported judgement.	**1**

(e) Discuss the factors a government should consider when deciding to pursue an infrastructure project such as high-speed rail. [8]

Question Analysis
Command word: Discuss, two sided with evaluative conclusion
Content: Government decision making process, MSB=MSC, benefits, costs, constraints consequences
Context: Any government
Analysis: R1 + R2

R1: Government to consider benefits of a project like high-speed rail

R2: Government to consider costs of a project like high-speed rail

Evaluative conclusion: Benefits at least equal to costs; constraints such as budget and accurate information; government's ability to limit extent of trade-offs etc	
Introduction	Government decision making is carried out within the marginalist framework. This framework suggests that the benefits and costs of a project are weighed against each other before the decision is made. Since it's a government decision it must consider societal interests as well. Therefore, the marginalist framework for government will be determined by societal benefits and costs and hence, allocative efficiency. A government will decide to go ahead with a project as long as the MSB of the project at least equals the MSC of the project. MSB=MSC.
Requirement 1: **Benefits**	The potential benefits that a government will consider when constructing a high-speed rail will include the following: The main alternative to high-speed rail is air transport. However, air travel is a significant culprit in contributing to carbon emissions and negative externalities. While high-speed rail may contribute to negative externalities in the short run during the construction phase, in the long run it is a cleaner and greener form of transport. This factor will be an important consideration. The adoption of high-speed rail by travellers will significantly reduce pollution and health risks among others as dependence on fossil fuel is reduced. The increased investment in constructing the infrastructure is rather large and will have a macroeconomic impact on the economy. As I is a component of the AD, the increase in I will lead to a multiplied increase in the AD and hence the national income and employment. Since infrastructure is involved here there is also a supply-side effect in that the productive capacity of the nation, the LRAS, is enhanced. For large countries, the greater connectivity between the regions will also enhance productivity. Raw materials, goods and people can move quickly and efficiently and this can reduce the unit cost of production thus enhancing the SRAS. Countries that are efficient producers of high-speed rail will develop expertise and technological advantages which can then be transferred overseas when they are awarded contracts to build high-speed rail for other countries. Japan and China are leading examples here. Such capabilities create job and export opportunities. Overall, the standard of living is likely to improve for countries that go ahead with such a project.
Requirement 2: **Costs**	As mentioned above, the construction of a high-speed rail is likely to incur negative externalities in the short run. As forest and land is cleared to lay the new tracks environmental degradation may occur, while there

		could also be impact on air, water and noise pollution. Humans, farm animals and wildlife may be affected. Fertile farmland may also be lost. Another major concern is the huge costs that will be incurred in the construction. High-speed rail costs run into the billions and is hardly ever recovered. The Chinese State Railway Group is heavily indebted as evidenced in extract 4. Due to the high costs, ticket prices may be out of reach for the average citizen. Countries that have incurred debt due to high speed rail construction, Laos and Indonesia, have had to renegotiate their agreements as they are unable to service their loans. Opportunity costs is another concern. The huge outlay implies that a country may have to forgo alternative decisions. The billions spent on high speed rail could have fetched dozens of hospitals or educational institutions.
	Evaluative conclusion	If the potential benefit is greater than or at least equal to the costs, than the decision should be. In the case of government decision making social benefits and costs also need to be considered. Hence, MSB=MSC is an important criterion. Besides the benefits and costs, governments will also need to consider factors such as budget constraints, availability of accurate information, consequences of taking such a decision and government's ability to limit the extent of any trade-offs. Rich countries are likely to have the budget and resources to undertake such projects, while poorer countries that borrow heavily may have limited ability to avoid trade-offs. Countries such as Sri Lanka and Maldives have had to pay heavy political costs due to unpopular decisions that were made with inaccurate information.

Level	Descriptors	Marks
L2	• Answer provides a **detailed and balanced response** of how benefits and costs are considered in the decision-making process within the marginalist framework • Makes use of data and contextual evidence.	**4-6**
L1	• One-sided answer focussing on only benefits or costs *or* • Answer shows some understanding and knowledge but is lacking in economic analysis • No use of data or contextual evidence.	**1-3**
E2	For an evaluative comment that builds on prior analysis.	**2**
E1	For an unexplained / unsupported judgement.	**1**

Total: [40]