



Case Study 2 – HCI BT2 2010 Q1

Recent developments in Air Travel

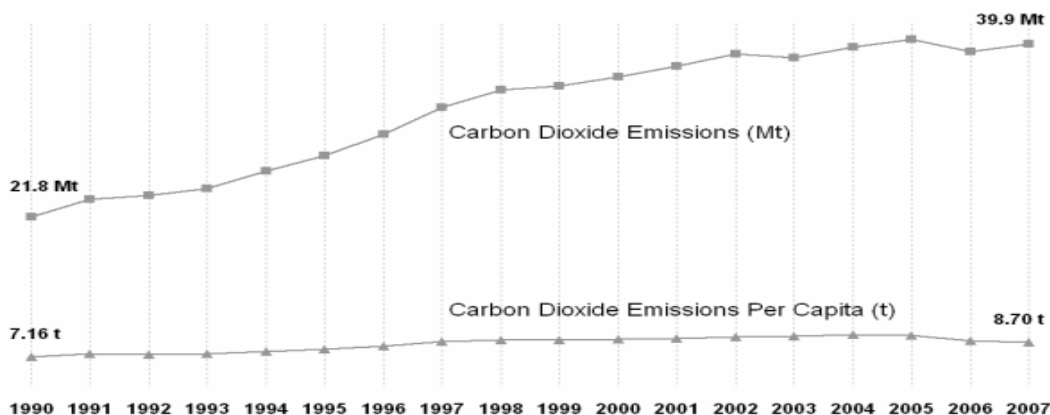
Extract 1: The Big Green Dilemma

No one disputes that flying causes carbon emissions, as well as other consequences such as noise pollution for those who live near airports. According to the 2006 Stern Report, flying accounts for 1.7% of all global greenhouse emissions – but power stations account for a massive 24% and other forms of transportation (shipping, train and road) for 12.3%. At the same time, there are benefits from flying – for example, tourism worldwide employs around 230 million people and generates 8-10% of world GDP. Flying is not always the worst choice environmentally, and it is very complex to analyse how different forms of transport compare, though it is suggested that flying is generally about nine times worse than taking the train and three times worse than a car with two passengers.

To counter this problem, European governments have started trading carbon permits to limit amount of emissions into the atmosphere. Singapore also takes a very serious stance to maintaining a successful global deal in the reduction of carbon emissions. However, Singapore is a "geographically disadvantaged country" that depends highly on the external sector. The need to travel by air has significantly increased with the rising affluence of the people and the growing amount of business done between Singapore and the rest of the world.

*Source: The Observer, July 2007 and
MFA press release 'Singapore Announces Climate Change Target', 02/12/2009*

Chart 1: Singapore's Carbon Dioxide Emissions, 1990 – 2007



Mt = Million tonne; t = tonne

*Source: Ministry of the Environment and Water Resources,
the National Climate Change Strategy and the Singapore Department of Statistics*



Extract 2: Analysis of the global airline industry

The airline industry in most countries globally has been deregulated such that entry barriers for new entrants are lower. Airlines are now free to negotiate their own operating arrangements with different airports; enter and exit routes easily; and set fares and flight volumes according to market conditions. Established airlines hold the monopoly over time slots for landing and take-off at certain airports, making it harder for new airlines to infiltrate.

In an era when airlines are losing billions of dollars amid volatile fuel prices and a pullback in spending, every carrier is looking to cut costs and increase scale, without having to change prices. Limited by restrictions on mergers with foreign airlines and waiting for someone else to make the next move, airlines are now seeking to expand their alliances and trying to extend synergies within current partnerships.

The three major alliances -- Star, SkyTeam and oneworld -- are global networks of carriers that allow members to streamline costs while sharing revenue.

Revenue in the Asia-Pacific region has grown by 9.6% in 2008 to reach \$101.1 billion. Passenger traffic also grew by 11.8% in 2008 to reach a volume of 526.3 million passengers. Analysts attribute much of this increase to the airlines using the internet to enhance the booking of tickets online. The internet has increased the competitiveness of the airline industry; allowing consumers to compare prices across airlines prior to booking. Others say that the internet has aided the airlines in achieving greater revenues through the practicing of price discrimination.

*Source: Adpated from Datamonitor, December 2009 and
Airline alliances becoming the new "mergers", Reuters, 26 Feb 2010*

Table 1: Top 4 Airlines in Asia-Pacific Region

Share of Asia-Pacific Airline Industry (by value of total revenues)	2007 %	2008 %
Japan Airlines	24.13	21.32
All Nippon Airways	15.62	14.22
Qantas Airways	13.74	13.38
Singapore Airlines	11.11	11.16

Source: Datamonitor, December 2009



Extract 3: Low-cost expansion

Full service carriers everywhere are struggling to stay afloat, with Japan Airlines succumbing to bankruptcy only last month. In contrast, the region's low-cost airline sector is buzzing with passenger growth and expansion plans. The underlying drivers of the boom for low-cost carriers appear to be in place: rapid growth in gross domestic product and gradual route liberalisation, which allows airlines to fly to more destinations.

For the moment, many of the Asian no-frills carriers are declaring profits. AirAsia booked a net profit of RM\$130m (US\$37m) for the quarter to September, and Cebu Pacific posted net income of 1.8bn pesos (US\$38m) for the first half of 2009. Tiger Airways, partly owned by Singapore Airlines, says it makes money from the low-cost operation out of Singapore in spite of rising fuel costs. Such carriers undercut prices at major airlines by using aircraft more frequently, packing in more seats, selling tickets directly via websites rather than travel agents and cutting in-flight services.

Source: The Financial Times, February 2010

Questions

- (a) (i) From Chart 1, compare the trend of Singapore's carbon dioxide emissions and carbon dioxide emissions per capita from 1990 to 2007. [2]
- (ii) State a reason for the difference observed in (a)(i). [1]
- (iii) Evaluate measures that the Singapore government can adopt to deal with the alleged negative externalities of air travel. [8]
- (b) Using Extract 3, analyse how the market for air passenger travel in Asia Pacific has changed. [4]
- (c) Explain how the internet has affected the ability of the airlines to practice price discrimination. [4]
- (d) (i) The Asia-Pacific airline industry has been described as oligopolistic. What evidence in the data supports this? [1]
- (ii) Discuss how the firms in the airline industry might compete against each other and how this might affect the society. [10]



- (a) (i) From Chart 1, compare the trend of Singapore's carbon dioxide emissions and carbon dioxide emissions per capita from 1990 to 2007. [2]

- Similarity: **Both** are increasing (1)
- Difference: **However**, the CO₂ emissions increase at a **faster rate than** CO₂ emissions per capita (1)

Note for tutors:

Emphasise the use of words like 'both' for similarity, 'connecting word such as however for contrast and remind the 'rate of change' is usually a good way to show difference.

- (ii) State a reason for the difference observed in (a)(i). [1]

Since CO₂ emissions per capita rises slower than CO₂ emissions, this mean that population in Singapore over the time frame must have increased at a slower rate than increase in CO₂ emissions.

Note for tutors:

CO₂ emissions per capita = CO₂ emissions / population.

In the actual BT2, most students stated population increased at a faster rate which is wrong!

Below is a numerical example that helps you to illustrate:

CO₂ emissions = 10

Population = 5

CO₂ emissions per capita = CO₂ emissions / population = 10/5 = 2

1. If population increases at a faster rate:

Double CO₂ emissions = 20

3x increase in Population = 15

CO₂ emissions per capita = CO₂ emissions / population = 20/15 = 4/3 = 1.33

If population increases at a faster rate, it will result in a FALL in CO₂ emissions per capita. This is wrong as the CO₂ emissions per capita is rising and not falling.

2. If population increases at a slower rate:

Double CO₂ emissions = 20

50% increase in Population = 7.5

CO₂ emissions per capita = CO₂ emissions / population = 20/7.5 = 2.67

If population increases at a slower rate, it will result in a gradual increase in CO₂ emissions per capita.

3. If both increase at the same rate, CO₂ emissions per capita will be constant.



- (iii) Evaluate measures that the Singapore government can adopt to deal with the alleged negative externalities of air travel. [8]

Show a 3.27 min video from <http://www.youtube.com/watch?v=l1sNaUuLmPM> uploaded by The Air Transport Association (IATA) on May 25, 2010

Note for tutors:

For such Higher Order Skills Question, remind the students to use the following steps:

1. Come up with the economic framework.
2. Insert evidence from the data

Also, looking at the marks awarded, 8 marks warrant 2-3 policies with limitations and final judgment. Since this is a case study, use measures that are mentioned in the data.

A possible framework:

Negative externality in air-travel: Air and noise pollution	
Possible Measures	
Trade permits (Extract 1, para 2)	Taxes and more specifically, green tax
Benefits and limitations	Benefits and limitations
Conclusion (Suggest long-term solutions)	

Suggested Answers

Introduction	
<ul style="list-style-type: none"> • Air travel gives rise to environmental costs resulting in misallocation of resources. • Identify and explain the 2 types of negative externalities. • Air pollution: CO2 emissions that has harmful spillover effects e.g. ill effects on health; respiratory disease. • Noise pollution: Harmful spillover effects e.g. those living near the airport disrupt sleep; daily routine e.g. study. • I shall evaluate the measures the Singapore government can adopt to deal with the alleged negative externalities of air travel. 	
Tradable permits (how it works)	Limitations
<ul style="list-style-type: none"> • The permits are a form of quantitative restriction and they are marketable or tradable. • The government's job is to determine the maximum permissible efficient level of pollution (i.e. fixed the quota) and leave it to the market to distribute the quotas efficiently amongst the airlines. • Each polluting firm must buy a permit which gives it permission to emit a certain amount of pollution. If not, it will have to clean up the pollution. • The price of each permit will then be determined in the market. The higher the price of permit, the greater the incentive for the firms to reduce emission. • Marketable permits give airlines the incentive to find ways to cut down 	<p>Government failure:</p> <ul style="list-style-type: none"> • Difficult to ascertain the socially optimal level of pollution in order to determine the quota or max permissible level of pollution. If over-supplied, the permit is cheaper than clean-up, airlines will not have the incentive to innovate and clean up. • Compliance issue. Airlines might not stick to the quota. Enforcement is required. But, difficult to measure pollution accurately to determine infringements has occurred. <p>For permits to work, require infrastructure i.e. institutional arrangement to facilitate carbon trading.</p> <p>Negative impact:</p>



<p>emissions (use fuel efficient aircraft, lighter aircraft, better ways of landing, etc) so that they can avoid having to buy the permits or they can sell/monetize the unused permits to airlines who encounter difficulties cutting down their emission level.</p>	<p>Large airlines may use this platform as an opportunity to engage in anti-competitive acts to ooze out smaller players buy bidding very high price for the permits. (Smaller airlines without permits will not be able to fly!)</p>
<p>Green or Carbon tax (How it works)</p> <ul style="list-style-type: none"> • Tax based on carbon emission from aviation fuels e.g. \$X tax per litre of fuel. • Fuel tax closes the divergence between private and social cost of production: i.e. bring private and social cost into alignment. Outcome => social optimal output where MSC=MSB. • In view of optimal resource allocation, travelers or airlines are made to internalise these external costs since they are not accounted for in their private costs: passengers (cost of the air-ticket)/airlines (cost of operation such as salary to cabin crew and fuel costs). 	<p>Limitations</p> <p>Government failure: Difficulty in measuring the pollution accurately so as to fix the tax at the socially optimal level. Technically, it would be very challenging to measure pollution at “high altitude” involving the use of a common resource i.e. air space.</p> <p>Challenging problem: <i>Extract 1: Demand for air travel increases with rising income e.g. by 11% in 2008.</i> Hence measures that aim at curbing the airline output to meet pollution targets will meet with severe constraints giving the growing demand for air travel.</p> <p>Some questions to ponder:</p> <ul style="list-style-type: none"> • <i>Whose skies exactly are the airlines polluting? E.g. Once an SIA A380 takes off from Changi Airport, it may be ‘polluting’ the skies of other countries!</i> • <i>How to clean it when air is a common resource? And in this case worse, it is high altitude pollution! Who should clean the air? Should it be the country that has the skies being polluted, the airlines or the country that gets the money from the permits/taxes?</i> • <i>If the main concern of high altitude pollution is depletion of the ozone layer, then all countries are responsible? Airspace not the issue.</i>
<p>Regulations/Rules (how it works)</p> <p>E.g. The regulatory body could impose physical limits on the number of flights to and from airports within their jurisdiction. OR impose fuel efficiency targets on airlines; eg. airlines must have introduced fuel efficiency methods in 5 years’ time which would reduce fuel per passenger mile from their current levels; packed the seats per aircraft say till 80% before it is allowed to take off; pilots must land the plane more economically Straightforward to devise, easier to understand by firms and easier to implement.</p>	<p>Limitations</p> <p>Compliance issue e.g. monitoring and deterrence</p>



Conclusion

Use environmentally friendly fuel and aircrafts.
Sustainable biofuel with no trade-offs with food supplies.

Technological solution

Best to resolve the problem at its source. The basic source of air pollution comes from the use of dirty or fossil fuels. Government can encourage the development and use of “green fuels” via subsidies for R+D and adoption.

Noise pollution

Similarly government can encourage the development and use of environmentally friendly aircrafts e.g. quieter engines. Citing airports away from residential areas e.g. Changi Airport is located near the sea to minimize noise and air pollution.

Essentially, high altitude pollution may worsen global warming which affects EVERYONE. This calls for a consolidated international effort in reducing it and thus funds will be collected to pump into R & D to come up with more environmentally friendly aircrafts or biofuel.

***to score level 3 marks for this question, students must evaluate 2 measures, of which 1 must be from the text (marketable permits).**

(b) Using Extract 3, analyse how the market for air passenger travel in Asia Pacific has changed. [4]

Note to tutors:

- **Highlight to students the question is on the ‘market’ of air travel and the correct economic framework is ‘DD-SS analysis’.**
- **Last year, many students used ‘revenue-cost’ framework.**
- **So this question requires answers that shift demand and supply.**
- **Base on the data, there is more air travel and prices are lower, it means there is an increase in demand and supply but the increase in supply outweighs demand.**
- **Also, always use words such as ‘From Extract 3, para 1’ to show the examiner you are indeed using information from the data.**



State	Elaborate
Change in demand (1m):	
Ext 3, para 1: rapid growth in GDP leads to an increase in demand for air passenger travel	Increase in income signals an increase in purchasing power and since air travel is a normal good, the demand rises when income increases.
↑DD - ↑P and ↑Q	
Change in supply (2m):	
Ext 3, para 2: Presence of low-cost carriers such as Tiger Airways, Cebu Pacific and AirAsia increase the supply	Since this means an increase in number of service providers.
↑SS - ↓P and ↑Q	
However, Ext 3, para 2: Rising fuel costs – leads to a fall in the supply of air passenger travel	Since cost of production is higher.
↓SS - ↑P and ↓Q	
Stand: (We want to show price indeed fall based on the case study)	
Supply must increase as increased presence of low-cost carriers outweigh the increase in fuel costs	

Final stand (1m):

Increase in supply of air passenger travel is likely to be more than the increase in demand for it, hence price is lower (extract 2, undercutting of prices) and output is higher.

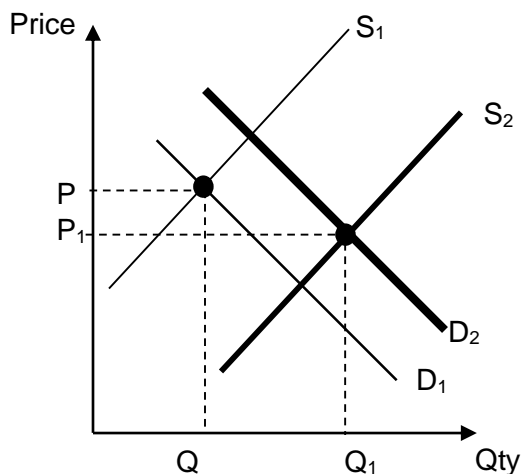


Fig 1: Market for air passenger travel

(*not necessary for students to draw dig – for tutors to illustrate)



(c) Explain how the internet has affected the ability of the airlines to practice price discrimination. [4]

Note for tutors:

- You may want to perform a live demonstration on buying an online air ticket and showing 'live' how airfares change within a short timeframe.
- You can also show the class the article 'Airlines told to end price discrimination by Stephen Castle'
- Highlight to students that this question requires 2 points as answers – can either be for or against the increased ability to practice PD

From Extract 2, para 4,

Evidence from Data	State and Elaborate
airlines have a better idea of who their customers are	This increases in ability to practice PD as it enables the airlines to have better identification of the market – those whose demand is more price-inelastic. E.g. online booking makes it possible to segregate the customers by dates and minutes – very last minute booking.
more competitive market as consumers can now compare prices more easily with the Internet	This decreases the airlines' ability to practice PD as better informed customers means harder for airlines to charge different pricing and they can turn to cheaper alternatives – lesser monopoly power.

2m for each point and max 3m for those who do not give 2-sided arguments



Independent.co.uk

Airlines told to end price discrimination

By Stephen Castle *Tuesday, 8 June 2004*

Europe's airlines have been forced to end price differences of up to 300 per cent offered on the same flights in different countries, after a six-month inquiry into their ticketing policies.

Europe's airlines have been forced to end price differences of up to 300 per cent offered on the same flights in different countries, after a six-month inquiry into their ticketing policies.

The announcement came at the end of an investigation by the European Commission into the fares charged by 18 European airlines including British Airways, Air France, Lufthansa, SAS, British Midland, and Virgin Atlantic. BA and SAS admitted having the different ticket charges but Giles Gantelet, spokesman for Loyola de Palacio, the EU transport commissioner, said all airlines had now ended the practice. "A little bit of naming and shaming has achieved results," he added.

One example discovered was of a return flight from Frankfurt to Berlin which cost €88 (£59) when purchased in Germany but €268 in Belgium. A 50 per cent differential was found in a flight between the UK and Germany.

Although the internet has revolutionised airline ticket sales, many companies still structure their systems so that travellers have to use a website geared to their country of residence. As personal information and credit card addresses have to be provided, and tickets often have to be mailed out, there is no opportunity to circumvent the system by using a site belonging to the same company in another country. Similar factors have applied to purchases made via travel agents or direct from airlines sales' offices.

However EU law means that companies are not allowed to discriminate between European customers on the grounds of their place of residence.

Of the 18 airlines contacted by the commission, 16 responded, with most saying that they did not operate in this way, and others saying they had stopped the practice. Italy's Alitalia said that, due to its current financial crisis, it was unable to give a proper response and Olympic Airlines of Greece failed to reply.

However a test by the commission confirmed that all airlines had ended the practices. Mr Gantelet said: "In rare cases some restrictions may still exist for certain paper-based tickets, but all electronic tickets are now available throughout the EU without discrimination, except - in some cases - for differences in handling fees. As a result, price levels are now similar for all EU residents." He added that the commission would continue to monitor the airlines to make sure the problem does not return.

Steve Double, head of news at BA, said: "It is an issue which we were always comfortable with and we were always confident of the outcome." Yesterday's announcement also marks a successful outcome for the Commission, which might have had difficulty making a legal case stick.

The Commission's powers over airline prices are limited, although it could take action if it judged that there had been a breach of EU treaty provisions, which lay down a level playing field for business within the internal market.



- (d) (i) The Asia-Pacific airline industry has been described as oligopolistic. What evidence in the data supports this? [1]

Market share – MCR₄ has been greater than 60% over the past 2 years and thus show the presence of a few dominant firms which is a characteristic of oligopoly.

Note to tutors:

Highlight to students, usually for a question on oligopoly, when a table with market share is given and it is a MUST to calculate the Market Concentration ration rather than using other information high barriers to entry which is true for monopoly or homogeneous product which is also true for perfect competition or non-price competition which is true for monopolistic competition..

Always give evidence that shows the unique characteristics (a few dominant firms and mutual interdependence) of oligopoly.

Unless such unique characteristics are absent in the case material, then settle for the '2nd best' answers such as high barriers to entry, etc which are still characteristics of oligopoly.

- (ii) Discuss how the firms in the airline industry might compete against each other and how this might affect the society. [10]

Note:

For such Higher Order Skills Question, use the following steps:

1. Come up with the economic framework.
2. Insert evidence from the data

There are two parts to the answers – methods of competition and impact on society.

A 10 marks question warrants a proper introduction, body and conclusion.

A possible framework:

Competition in air-travel	
Possible Methods of Competing	
<i>Price-cut by budget airlines Impact on society: Benefits or costs?</i>	<i>As there is price rigidity, airlines will engage in non price competition Impact on society: Benefits or costs?</i>
Conclusion: Which is more likely?	

Introduction

I will be examining how the airlines might compete against each other in an oligopolistic industry and how this might affect the society.

Body

Evidence from the extract includes:

Increase in contestability in the market (extract 2 – deregulation of the airline industry)

Methods of competition:

1. Price-cutting by budget airlines as they offer no-frills service
2. Due to price-rigidity, there will be non-price competition by full-fledged carriers



(1) Price-cutting by budget airlines as they offer no-frills service	
State and Elaborate	Exemplify with Data/Contextual e.gs.
<p>Reduce Price Budget/Low-cost airlines reduce airfare to raise revenue.</p> <p>Assuming demand is price elastic due to many airlines flying the same routes, a lower airfare will increase quantity demanded more than proportionate and thus increase revenue.</p>	<p>Budget airlines have much lower variable costs compared to full-fledged carriers and thus translating the cost savings to lower prices. E.g. land on budget terminal, no-frills as they do not offer meals and in-flight entertainment, save on middleman fee as booking are done directly at airlines via internet rather than agents.</p> <p><i>Note: Budget airlines also have lower fixed costs as they can rent planes instead of buying or buy commercial planes that are converted from military ones.</i></p>
<p>Evaluation: Budget airlines are able to undercut prices as they have a different cost structure as compared to full-fledged national carriers.</p> <p>It is infeasible for national carriers to engage in a price war with the budget airlines. Even if they cut airfare, it is at best a short-term measure. Also, such airfare cuts are only for a small number of passengers and they serve as publicity gimmicks rather than genuine price cut and they come with many hidden costs.</p>	
<p>Impact on society (benefits): Air travelers enjoy lower airfares and thus experience an increase in consumer surplus.</p>	
(2) Non-price competition by full-fledged carriers	
<p><i>Note: Before elaborating on non-price competition, it is critical to justify why there is no price competition.</i></p> <ul style="list-style-type: none"> Airlines would choose to engage in non-price competition due to mutual interdependence. There are only a few airlines under oligopolistic market structure and thus each airline has to take into account the actions/reactions of other firms and as a result, there is price rigidity. If an oligopolistic firm increases price, other firms will not follow and it will lose its consumers to the competitors, and quantity demanded will fall more than proportionate leading to a loss in revenue. If it engages in a price competition by reducing price, other firms will probably respond by reducing their prices as well and the quantity demanded will increase less than proportionate and result in lower revenue. Hence, airlines will more likely engage in non-price competition. 	
State and Elaborate	Exemplify with Data
<p>Product differentiation is done by airlines to increase demand for their services and make their demand more price-inelastic with differentiated services.</p>	<p><i>From Extract 3: Airlines attempted to provide better service: Use internet for bookings – convenient and consumers can compare prices across airlines.</i></p> <p><i>Fly to more destinations</i></p>



	<i>Own relevant knowledge: Better in-flight services; frequent flights; advertising and branding.</i>
<p>Impact on society (benefits): Competition will lead to an increase in consumer welfare in terms of better airline products such as travelling by shorter routes that save time, more frequent flights and better services by cabin crew and in-flight entertainments. All these also encourage tourism and improve quality of life and export revenue for the countries.</p>	
<p>Impact on society (costs):</p> <ul style="list-style-type: none"> • But if the non-price competition is in the form of persuasive advertising, the higher costs may be translated to unnecessary increase in airfare. • Worsening market failure: If air-travelling indeed increase due to non-price competition and other factors such as rising income, air pollution may worsen as mentioned in <i>Extract 2, para 1 that flying is 9 times worse than taking other modes of transport and in Extract 2, para 4 states that the passenger traffic grew by 11.8% in 2008 to reach a volume of 526.3 million passengers.</i> 	
<p>Conclusion</p> <ul style="list-style-type: none"> • Besides price and non-price competition, it is crucial for airlines to form alliances such as the three major alliances -- Star, SkyTeam and oneworld which are global networks of carriers that allow members to streamline costs while sharing revenue. • Overall, the society do benefit from these measures of competition in terms of cheaper airfare and lesser carbon emission when airlines are able to cut costs by using technology and fuel-efficient aircrafts and better services especially in terms of shorter routes and safety. • As long as the industry remains contestable, consumers will stand to benefit. Society as a whole will gain in terms of higher export revenue in terms of tourism and more jobs available. 	

L3	Good, balanced analysis based on the case material and good use of economic analysis	7-8
L2	Explains the strategies of airlines using economics and with some references made to the case material and mentions impact on society.	4-6
L1	Describes strategies of airlines in a general manner (no/minimal use of economics) and with little reference to case material; no or little mention of impact on society	1-3
E1	Attempts to synthesise when there are conflicting views.	1
E2	Provide good synthesis and a reasoned conclusion	2