

APPLICATION OF ECONOMIC CONCEPTS TO AUTHENTIC SITUATION – (1) AVIATION INDUSTRY IN HONG KONG



Background

This resource pack is published to support teachers in guiding students to explore and apply economic concepts to authentic cases. The aims of carrying out these activities are to enhance students' learning of economics as well as facilitate their appreciation of the wide application of economics to their daily life.

The Education Bureau has invited Professor Michael Fung, the Executive Director of the Aviation Policy and Research Centre, Business School of CUHK to develop this resource pack. The pack first outlines the background and economic contributions of the aviation industry, a core sector in the logistic industry-one of the four pillar industries in Hong Kong. It then followed by the application of economic concepts e.g. economies of scale, and aggregate demand & aggregate supply model in the analysis of the industry. Analytical questions and suggested answers in the last section are designed to direct students' search for deeper understanding of the relevant economic concepts.

If you have any comments and suggestions on the resource pack, please send them to

Chief Curriculum Development Officer (Personal, Social and Humanities Education)
Curriculum Development Institute
Education Bureau
Room 1319, 13/F., Wu Chung House
213 Queen's Road East
Wanchai, Hong Kong
Fax.: 25735299
E-mail: ccdopshe@edb.gov.hk

I. An overview of the aviation industry in Hong Kong

In aviation industry, airlines provide passengers with transportation and other services. Hong Kong International Airport is one of the busiest and best airports in the world.¹ There are over 150 airline destinations around the world and these routes are served by more than 100 airlines.² The 2011/2012 Hong Kong International Airport Annual Report showed that passenger traffic, cargo throughput and air traffic movement were 54.9 million, 3.9 million of tons and 339 thousands respectively.³

Among these airlines, Cathay Pacific Airways is a Hong Kong-based airline which has a large network of subsidiaries in HK aviation industry. It has more than 22,000 employees in Hong Kong and owns 132 aircrafts in its fleet. It offers scheduled cargo and passenger services for 162 destinations.⁴

Airline industry can bring direct and indirect benefits to the economy as it requires support from many industries. For direct benefits, they include the value added brought from air transport and air cargo forwarding services, travel agents and airline ticket agents (outbound). These services have contributed to Hong Kong GDP by about 2.7% in 2009.⁵ For indirect benefits, they include the value added brought from tourism (aviation-supported), international trade services, courier services, land transport services and miscellaneous services that support air cargo operations. When all aviation-related activities are considered, the total economic contribution made by the aviation industry was HK\$116.3 billion in 2009. It was approximately 7.50% of the local GDP.⁶

¹ Please refer to the list of awards in page 4.

² <http://www.hongkongairport.com/eng/business/index.html>

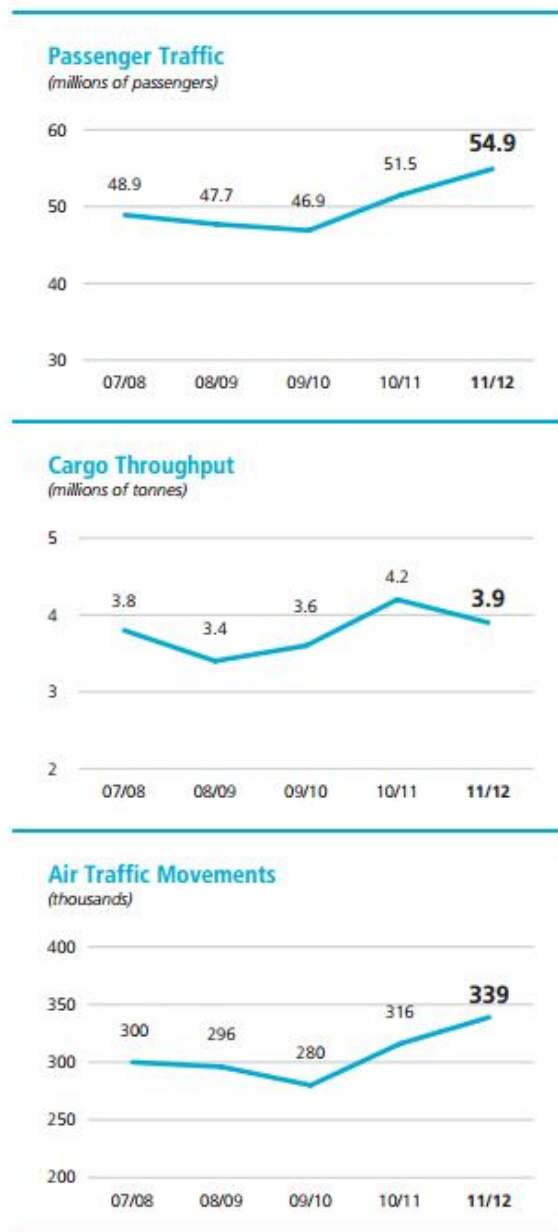
³ Hong Kong Airport Authority Annual Report 2011/12,
<http://www.hongkongairport.com/eng/media/publication/annual-reports-2011-12.html>

⁴ Cathay Pacific Airways Annual Report 2011

⁵ CUHK Aviation Policy and Research Center (2012), Economic Contribution of Air Transport Sector in Hong Kong (Table 1).

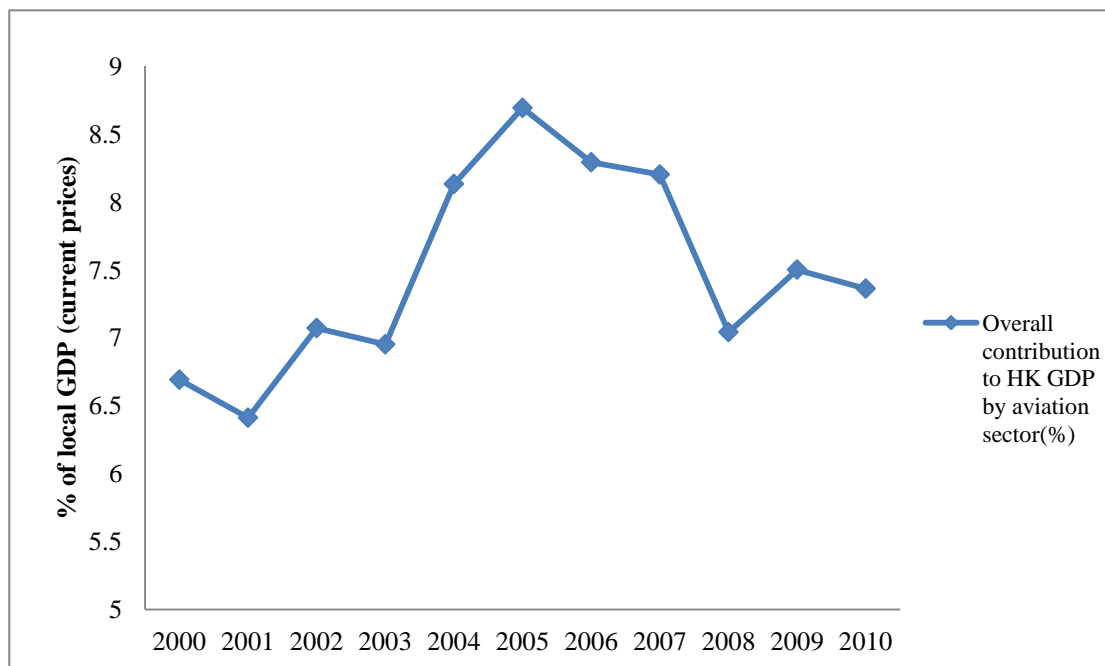
⁶ CUHK Aviation Policy and Research Center (2012), Economic Contribution of Air Transport Sector in Hong Kong (Table 8).

Figure 1 Performance of Passenger Traffic, Cargo Throughput and Air Traffic Movements of Hong Kong International Airport from 07/08 to 11/12



Source: Hong Kong Airport Authority Annual Report 2011/2012

Figure 2 Overall Economic Contribution to HK GDP by Aviation Industry from
2000 to 2010



Source: CUHK Aviation Policy and Research Center, Economic Contribution of Air Transport Sector

(2011 Table 5, 2012 Table 8)⁷

⁷There was a change in classification system of industries by HK Census of Statistics Department in 2009. So the values before 2009 may be slightly different from the values after 2009.

Hong Kong International Airport and airlines have been appraised widely by the world. Their awards are shown in the list below.

Figure 3 Awards or prizes received by Hong Kong aviation industry from 2007 to 2012

Organization / Company	Prize or award:
Hong Kong International Airport	<p>2007:</p> <ul style="list-style-type: none"> ● Asia-Pacific Airport Efficiency Excellence Award from Air Transport Research Society ● Best International Airport Prize in the 2007 TravelWeekly (Asia) Industry Awards ● World's Best Airport in annual Skytrax survey (6th time in 7 years) <p>2008:</p> <ul style="list-style-type: none"> ● Recognised in the British Safety Council's International Safety Awards scheme ● Best Airport by TTG Asia and Business Traveller China <p>2009:</p> <ul style="list-style-type: none"> ● Best Airport by ACI <p>2010:</p> <ul style="list-style-type: none"> ● Best Airport by ACI, TTG Travel Awards and Business Traveller China <p>2011:</p> <ul style="list-style-type: none"> ● Best Airport by TTG Travel Trade Publications ● Air Cargo Excellence Survey from Air Cargo World
Cathay Pacific Airways	<p>2007:</p> <ul style="list-style-type: none"> ● Airline of the Year by TTG Asia ● Best North Asia Airline/Best Transpacific Airline in OAG 25th Annual Awards <p>2008:</p> <ul style="list-style-type: none"> ● Best Airline of Business Class by TTG Asia ● Best First Class Airline by Skytrax <p>2009:</p> <ul style="list-style-type: none"> ● Airline of the year 2009 by Skytrax ● Best Airline of First Class / Business Class by TTG Asia andSkytrax ● Best Asia Pacific Carrier by Air cargo news

	<ul style="list-style-type: none"> ● Best Environmental Performance Airline in 2009 by CAPA <p>2010:</p> <ul style="list-style-type: none"> ● Cargo Airline of the Year by CAPA ● Carrier of the Year in Canadian International Freight Forwarder Association <p>2011:</p> <ul style="list-style-type: none"> ● Best Airline Transpacific and Best First Class Seat Award by Skytrax
Dragonair Airways	<p>2008:</p> <ul style="list-style-type: none"> ● Best Regional Airline: South East Asia by Skytrax ● Best Asian Airline in 2008 Annual Hurun Report Best of the Best Awards <p>2010:</p> <ul style="list-style-type: none"> ● Best Regional Airline by TTG Asia Travel Awards ● Best Airline of Economy Class by Business Traveller China ● Best Regional Airline: South East Asia by Skytrax <p>2011:</p> <ul style="list-style-type: none"> ● World's Best Regional Airline and Best Regional Airline Asia by Skytrax ● Air Cargo Award of Excellence in 7th annual Air Cargo Excellence survey ● Best Regional Airline in the TTG Travel Awards
Hong Kong Airlines	<p>2012:</p> <ul style="list-style-type: none"> ● 4 Star-rating by Skytrax ● Capital Weekly Service Awards

Source: Hong Kong Airport Authority interim and annual report (2006/07, 2007/08, 2008/09, 2009/10,

2011/12), Cathay Pacific Airways annual report (2006, 2007, 2008, 2009, 2010, 2011),

Hong Kong Airlines website http://www.hongkongairlines.com/en_HK/aboutus/awards

II. Applications of economics in aviation industry

- Economies of scale

“Features of a firm’s technology that leads to a falling long-run average cost as output increases.” (Parkin 1999, G-3)

→ Cathay Pacific has built a HK\$5.9 billion cargo terminal in Hong Kong International Airport⁸. As the fixed cost is large, when there are more cargoes coming through the terminal, the average total cost will decrease.

→ Cathay Pacific placed an order of additional 10 A350-1000 aircraft and converted the existing order of 16 A350-900 aircraft into A350-1000 aircraft with Airbus S.A.S. on 8th August 2012.⁹The incremental price for conversion was about US\$1.087 billion and the additional order of 10 aircrafts was about US\$3.286 billion. Since the fixed cost is large, the average total cost will decrease if there are more passengers to take the planes.

- Scope economies

“A firm experiences economies of scope when it uses specialized (and often expensive) resources to produce a range of goods and services.” (Parkin 1999, p.213)

→ In 2011 Annual Report of Cathay Pacific, the percentage of income¹⁰ from passenger services was 68.9% while that of cargo services was 26.4%. An aircraft can carry passengers and cargo together so the company can make full use of the resources to generate more income.¹¹

⁸<http://www.scmp.com/business/companies/article/1125133/cathay-cargo-terminal-opens-weeks>

⁹http://downloads.cathaypacific.com/cx/investor/announcement/2012_08_08_CX_Major_Transaction_Announcement_en.pdf

¹⁰ The figures for income from passenger services and cargo services are from Cathay Pacific Airways Annual Report 2011, turnover for passenger services and turnover for cargo services respectively.

¹¹Cathay Pacific Airways Annual Report 2011

→ Hong Kong International Airport (HKIA) simultaneously provides aeronautical¹² and commercial services because it has enough land resources to operate these services together. In 2012/13 Interim Report of HKIA¹³, the percentage of aeronautical activities from total turnover was 52.7% while that of commercial activities was 47.3%.

- Network economies

“The product will be much more valuable if more people use it.” (Frank and Bernanke 2009, p.238)

→ Cathay Pacific launched Milan and Moscow as new destinations in 2010.¹⁴ The new destinations could attract passengers from nearby cities, such as Seoul and Taipei, to stop at Hong Kong. Then, they could take long-haul flights en route to other places. The air carrier can also make use of the network to earn more from passengers of different regions.

- Price discrimination

“It is the practice of selling different units of a good or service for different prices or of charging one customer different prices for different quantities bought.” (Parkin 1999, G-8)

→ Leisure tourists and business travellers have different sensitivities to time. Usually, business travellers are more rigid in arranging their trips on time whereas tourists are willing to book their tickets much earlier. Hence, tourists have a higher elasticity of demand for air tickets than that of business travellers. Airlines can thus make use of tourists’ time constraints to

¹² Aeronautical services: “fees paid for traditional core airport-related activities, such as provision of runways, aircraft stands, facilitation and security areas associated staff to undertake such activities.” Airport Council International October 2007 Report

¹³ <http://www.hongkongairport.com/eng/pdf/media/publication/report/interim/2012.pdf>

¹⁴ Cathay Pacific Airways Annual Report 2010

charge them different prices and maximize their revenues. (Besanko and Braeutigam2011)

- Vertical integration

“It is the integration of a firm with its supplier or customer.” (Stiglitz 1997, A15)

→ Cathay Pacific has been holding different subsidiaries, such as Hong Kong Airport Services Ltd which is a subsidiary of Dragonair. It merged with Cathay Pacific in November 2008.¹⁵ It provides complementary services, like aircraft handling, baggage services, flight dispatch and cargo services, for the airlines and passengers in the airport.¹⁶

- Horizontal integration

“It is the integration of a firm with other firms producing the same product.” (Stiglitz 1997, A6)

→ Cathay Pacific had acquired Dragonair in June2006 at HK\$100 billion and exchanged about 17% shares with Air China. The merger of Cathay Pacific and Dragonair is an example of horizontal integration for they were previously competitors in the same market.¹⁷

- Barriers to entry

“They are the factors that prevent firms from entering a market, such as government rules or patents.” (Stiglitz 1997, A2)

→ Air carriers have to obtain an Air Operator’s Certificate (AOC) from Civic Aviation Department (CAD) before they can operate a route in the airport. The Director-General of CAD would review the applicant to check if he/she has *“the adequate organisation, method of control and supervision of flight operations, training programme as well as ground handling and*

¹⁵ Cathay Pacific Airways Annual Report 2008

¹⁶<http://www.has.com.hk/en/services.php>

¹⁷http://www.hkexnews.hk/listedco/listconews/SEHK/2006/0630/LTN20060630133_C.PDF

maintenance arrangements consistent with the nature and extent of the operations specified.”¹⁸

- External benefits

“A benefit of an activity that falls on people other than those who pursue the activity.” (Frank and Bernanke 2009, p.298)

➔ According to a study by Oxford Economics in 2012, the whole aviation industry can support 34.5 million jobs within tourism. As more than 51% of tourists travel by air, aviation industry can create 14.4 million jobs in tourism directly (including hotels, restaurants, tourist attractions, local transport and car rental but excluding jobs in aviation industry) since tourists would spend in the foreign countries. Also, 13.2 million jobs are created in the industries supplying to tourism supported by visitors arriving by air indirectly.¹⁹

➔ Aviation industry in Hong Kong has supported many related industries like tourism and international trade. The value added of trade related services²⁰ by air increased from HK\$59.2 billion in 2005 to HK\$59.5 billion in 2009. The value added of inbound tourism²¹ by air also increased from HK\$7.95 billion in 2005 to HK\$8.03 billion in 2009.²²

¹⁸http://www.cad.gov.hk/english/reports/CAD360_part1.pdf

¹⁹http://www.aviationbenefitsbeyondborders.org/sites/default/files/pdfs/MAIN_REPORT_ABBB_A_global_industry.pdf

²⁰ Trading and Logistics includes wholesale, import and export trade, freight transport and storage services, postal and courier services. (HK Census and Statistics Department 2012, The Situation of the Four Key Industries in Hong Kong Economy in 2010)

²¹ Inbound tourism includes accommodation services, cross-boundary passenger transport services, retail trade, food and beverage services and others. (HK Census and Statistics Department 2012, The Situation of the Four Key Industries in Hong Kong Economy in 2010)

²²CUHK Aviation Policy and Research Center (2012), Economic Contribution of Air Transport Sector in Hong Kong Figures used here illustrate the value added brought by air in the relevant industries.

- External costs

“A cost of an activity that falls on people other than those who pursue the activity.” (Frank and Bernanke 2009, p.298)

→ Greenhouse gases emission of aircraft

Present situation: Aircraft would release carbon dioxide, water vapour, nitrogen oxides, carbon monoxide, oxides of sulphur and etc. during their flights by burning kerosene as fuels.²³

According to a report released by International Energy Agency in 2012, international aviation industry has emitted 455.3 million tons of carbon dioxide and this amount has risen by 78.3% when compared to the amount in 1990.²⁴

As the demand for aviation services grows over time, if no new policies are imposed on the emission of greenhouse gases, the total growth from current level in 2008-2009 will increase by 60% in 2030.²⁵

Problems caused: Most of these air pollutants are greenhouse gases which would trap heat in the air so global warming will be worsened. Water vapour and nitrogen oxides may even reinforce the warming effect by forming more ozone. If global warming persists, we will suffer from extreme weathers like droughts and floods more often.²⁶

Remedies: Some countries launched emission trading systems (ETS) to reduce the greenhouse gases emission. European Union, Australia, New Zealand, Norway etc. have been developing ETS for a few years already. In EU, the Commission will allocate some tradable quotas to commercial airlines for free

²³http://www.faa.gov/regulations_policies/policy_guidance/envir_policy/media/aeprimer.pdf

²⁴<http://www.iea.org/publications/freepublications/publication/CO2emissionfromfuelcombustionHIGHLIGHTS.pdf>

²⁵The organization estimate this under BAU (business as usual) conditions.

<http://www.c2es.org/docUploads/aviation-and-marine-report-2009.pdf>

²⁶<http://www.c2es.org/facts-figures/basics>

according to their average emissions of carbon dioxide per year.²⁷ They are only allowed to emit 1 metric ton of carbon dioxide by the allowance within the period of contract. EU has planned to promote this ETS to commercial airlines outside European region for further reduction of carbon dioxide released by aviation industry.²⁸ Yet, other countries have opposed fiercely so the plan has not imposed yet.

→ Noise generated by aircraft

Present situation: Aircraft produce noises when they take off or land on the airports. Hong Kong Airport Authority has announced the assessment of noise in the Master Plan 2030. Noise will become more annoying particularly at night time as Hong Kong Airport is quite close to residential area on Lantau Island.

Problems caused: Noise will bring negative impacts on our health through disturbing our activities, especially at night time. Humans will be stressed under noise with long duration and high frequency. At night, residents nearby might have sleeping problems as they get disturbed. In the long run their mentality will be harmed. Children are vulnerable to noise and their cognition will be affected, such as difficulties in concentration.²⁹

Remedies: HK Airport Authority would arrange aircraft to use another runway and routes at night (23:00 – 6:59) to avoid aircraft flying over residential areas (Shatin, Tsuen Wan and Sham Tseng). Also, the Authority encourages airlines to adopt new models of aircraft when they arrange flights at night because new models are quieter than others. (e.g. B787, A350, B747-8F and B777F)³⁰

²⁷ The distribution of quotas: 85% given for free to aircraft operators, 15% allocated by auctions, 3% reserve for later distribution.

²⁸ http://ec.europa.eu/clima/policies/transport/aviation/index_en.htm

²⁹ <http://www.caa.co.uk/docs/33/ERCD0907.pdf>

³⁰ Hong Kong Airport Authority, Chapter 5 of Hong Kong International Airport Master Plan 2030.

III. Analytical questions and suggested solutions

1. Mr. and Mrs. Pang would like to take a holiday trip to Taipei for five days. They plan to bring their son Peter with them. Peter is 10 years old and is studying Primary 4 now and it is the first time for him to travel overseas. In order not to let Peter miss any class, they can only choose travelling during school vacations. Their friend, Paul, is working as an office assistant and would like to travel alone to Taipei over the weekend. Any weekends should be fine to him.

Answers to part (a) and (b) are omitted.

- (a) Now, Mr. and Mrs. Pang decided to go to Taipei during the Christmas holiday from Dec 22, 2012 to Dec 26, 2012. Please check the lowest air ticket prices of Economy Class of round trip via Hong Kong Airlines' website³¹ or via Cathay Pacific Airways' website³² and fill in the details below:

Time period:	<u>Dec 22 – 26, 2012</u>	
Name of the airline company:	_____	
Flight type:	<u>Round Trip</u>	
Cabin Class:	<u>Economy</u>	
Flight number:	_____	
Passenger	Airfares (+ taxes) in HKD	Quantity
Adult		
Child		
Total amount: <u>HK\$</u> _____		

³¹ Website of Hong Kong Airlines: www.hongkongairlines.com

³² Website of Cathay Pacific Airways: www.cathaypacific.com

- (b) Paul is browsing the same website of online ticket booking. He would like to travel from September to December. In addition, he wants to fix the travel period for 5 days from Saturday to Wednesday the following week. Please search for Paul the required air ticket of Economy Class (with the lowest price) of round trip that has a ticket price lower than that for Dec 22 – 26, 2012. Please fill in the table below:

Name of the airline company: _____		
Flight type: <u>Round Trip</u>		
Cabin Class: <u>Economy</u>		
Time Period	Flight Number	Airfares (+ taxes) in HKD
Dec 22-26, 2012		

- (c) Some airline companies, e.g. Cathay Pacific Airways Limited, have different sub-classes for the economy class. Please list out all the sub-classes and the differences between them. Why would there be price differences between different sub-classes? Try to make a sensible guess.

Fare Family of Economy Class at Cathay Pacific Airways (data are retrieved at June 20, 2012 for a round trip from Hong Kong to Taipei):

	Economy Special	Economy Core	Economy Standard	Economy Flex
Rebooking	HKD600	Free of Charge	Free of Charge	Free of Charge
Cancellation	Before departure:	Before departure:	Before departure:	Before departure:

	HKD600 After departure: No refund	HKD600 After departure: No refund	HKD600 After departure: No refund	HKD250 After departure: HKD250
Upgrade with Miles	✗	✗	✓	✓
Minimum Stay	2 day(s)	2 day(s)	2 day(s)	No minimum stay
Maximum Stay	7 day(s)	14 day(s)	2 month(s)	12 month(s)
No Show Charge	HKD600	HKD600	HKD600	No Penalty
Price Range	Least expensive	Second least expensive	Third least expensive	Most expensive

The less expensive is a sub-class, the more restrictions are imposed. For example, rebooking of a Economy Special ticket requires a payment of HK\$600, while it is free for other classes. Passengers can stay at the oversea country for a maximum of 7 days only. Passengers travelling in Economy Flex have no minimum stay restriction and can stay abroad up to 12 months. Moreover, they will receive no penalty for not showing up.

- (d) Paul knows Mr. and Mrs. Pang plan to buy the more expensive tickets, what keeps him from buying the cheaper tickets and resell those tickets to them?

Airline tickets are not transferable.

- (e) Could you suggest three critical factors for the airline company to practise price discrimination of flight tickets?
- (i) The airline company can separate customers into categories.
- (ii) There exist different price elasticities of demand between different groups of customers.
- (iii) The airline company has market power to influence prices and output in a market, and block resale of air tickets.
2. In June 2011, The Airport Authority Hong Kong (AAHK) has released its *Hong Kong International Airport Master Plan 2030 (MP2030)*³³, outlining the future expansion plans of the airport. One of the plans was the construction of the third runway to increase the airport's capacity in handling air traffic movements.
- (a) (i) Please list out the determinants of aggregate demand and aggregate supply in the short run.

Determinants of AD curve are the "other things" (besides price level) that can cause a shift or change in demand.

AD: changes in consumer spending, investment spending, government spending and net export spending.

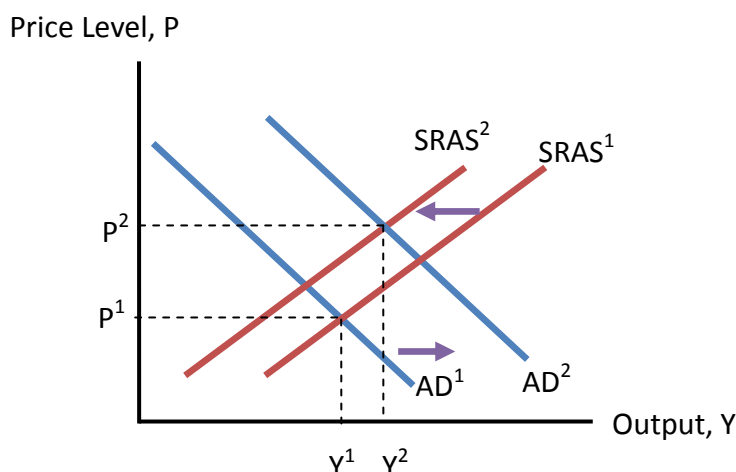
SRAS: changes in the labour force, productivity, input prices, technology, expected changes in the future price level, and legal institutional environment (business taxes and/or subsidies, government regulations).

³³ Retrievable at <http://www.hkairport2030.com/en/information/publications.html>

- (ii) Suppose the AAHK is carrying out the construction of new runway of the Hong Kong International Airport. According to AAHK, the construction needs an investment of HK\$86.2 billion (in 2010 dollars) between 2016 and 2030³⁴.

What do you expect about the changes in aggregate demand? Please draw a diagram and explain.

Construction investment will shift the aggregate demand curve to the right from AD^1 to AD^2 as AAHK will hire a lot of engineers and construction companies and hence increase the income of the economy as a whole.



- (iii) During the construction period, approximately 97,000 job-years³⁵ are generated, mainly related to construction and engineering activities³⁶. What would happen to the aggregate supply curve in the short run? Please draw on the diagram in part (ii) and explain.

During the construction period, higher demand on workers shall increase the nominal wages and expected inflation. The short run supply curve therefore shifts to the left from $SRAS^1$ to $SRAS^2$.

³⁴ Hong Kong International Airport Master Plan 2030 Summary, p.8

³⁵ A job-year is one person employed full time for one year.

³⁶ HKIA Master Plan 2030 Technical Report, p.191

(iv) What will happen to the equilibrium price level and real GDP?

At equilibrium, the price level will increase from P^1 to P^2 while the change in real GDP is uncertain. The workforce 2/2012-4/2012 was 3.77 million. 97,000 job-years accounts for 2.5% of labour force, hence, the effect on wage rate may be minor. We expect the shift of SRAS is smaller than AD curve, meaning real GDP shall increase from Y^1 to Y^2 at equilibrium.

(b) (i) What are the determinants of aggregate supply in the long run?

LRAS: changes in labour and capital stock supply, productivity of labour, and technology.

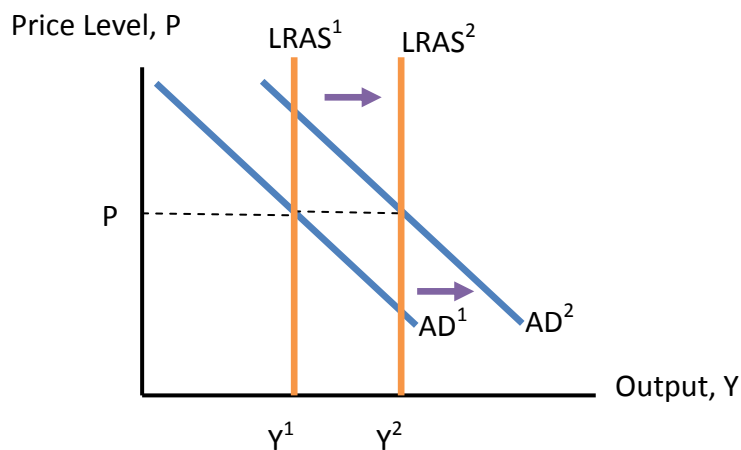
(ii) Please explain how tourism industries would be benefitted from the construction of a new airport runway.

The construction of a new airport runway will increase the maximum traffic capacity HKIA can handle. As a result, the efficiency of the airport will be enhanced; the occurrence of flight delays will be lowered and the flight frequencies to/from certain cities will increase. These factors shall attract more tourists coming to Hong Kong by air.

(iii) It is said that the developments of four economic pillars of Hong Kong (i.e. financial services, trading and logistics, tourism, and producer and professional services) rely heavily on air transport³⁷. After the completion of the new runway, there should be decrease in delays and increase in efficiency in travels to and from Hong Kong. What would you expect about the potential changes in aggregate demand and aggregate supply curves in the long run? Please draw another diagram to explain.

³⁷ HKIA Master Plan 2030 Summary, p.2

Decrease in delays and increase in the efficiency in transportation can probably increase the capital stock and labour supply of the economy. Therefore, LRAS curve shall shift to the right, from LRAS¹ to LRAS². Moreover, the lower transportation costs of overseas products shall increase the demand of net export. AD curve will shift to the right, from AD¹ to AD².

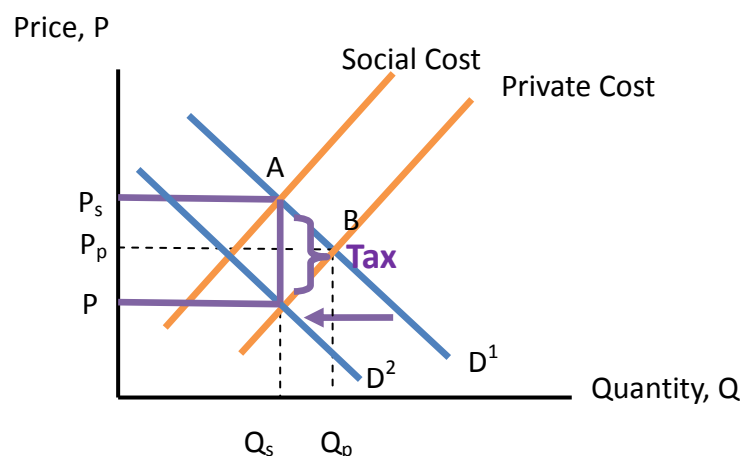


(iv) According to part (ii) and (iii), what will happen to the equilibrium price level and real GDP?

At equilibrium, the movement of price level is uncertain. The real GDP will increase from Y^1 to Y^2 .

3. One of the main concerns about the expansion of the Hong Kong International Airport is pollution to the environment. According to AAHK, the air quality issues can be categorized into construction phase and operational phase. The operational phase issue involves “potential increase in air emissions from phased increase in aircraft movements and airport operations under the three-runway option”³⁸. Suppose the government would like to impose a tax on passengers to combat the air pollution problem caused by increased transport.

(a) Pollution problem brought by air travel is one type of negative externality. Using a diagram, please show how the air pollution problem can lead to market failure.



The social optimum should be at point A, taking into account the social cost incurred by pollution. However, the market equilibrium is at point B, resulting in more air travels than the optimal level.

³⁸ HKIA Master Plan 2030 Technical Report, p.165

- (b) On the same diagram, show how the passenger tax could lessen the pollution problem. Briefly explain.

After imposing tax on passengers, the demand curve (D^1) will shift to the left (D^2).

The equilibrium quantity is Q_s , passengers will pay at P_s while the airline companies will receive P . Per unit tax equals $P_s - P$.

- (c) Please state one difficulty in implementing the policy.

It is difficult to evaluate the social cost of air pollution brought by the increased air traffic. Therefore, it is hard to determine the tax amount imposed to passengers.

-END-

IV. Suggested references materials for teachers and students' further exploration

Webpages, Articles and Research Reports

1. Air Transport Action Group
<http://www.atag.org/>
2. Aviation Benefits Beyond Borders
<http://www.aviationbenefitsbeyondborders.org/>
3. Hong Kong Airport Authority Annual Report
<http://www.hongkongairport.com/eng/media/publication/annual-reports-2011-12.html>
4. Hong Kong International Airport Master Plan 2030
<http://www.hkairport2030.com/en/>
5. Cathay Pacific Airways Annual Report
http://www.cathaypacific.com/cpa/en_INTL/aboutus/investor/annualreports
6. Civil Aviation Authority—Environmental Noise and Health: A Review
<http://www.caa.co.uk/docs/33/ERC0907.pdf>
7. CUHK Aviation Policy and Research Center
<http://www.baf.cuhk.edu.hk/research/aprc/profile/profile1.html>
8. CUHK Aviation Policy and Research Center Commentary (1/3/2012):
香港航空業的經濟貢獻
<http://www.baf.cuhk.edu.hk/research/aprc/word/71EconomicContribution1Mar12.pdf>
9. CUHK Aviation Policy and Research Center Commentary (1/9/2011):
興建第三跑道: 如何達致社會共識?
<http://www.baf.cuhk.edu.hk/research/aprc/word/70ThirdRunway1Sep11.pdf>

10. CUHK Aviation Policy and Research Center Commentary (2/8/2011):
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http://www.baf.cuhk.edu.hk/research/aprc/word/CK32CarbonEmission_2Aug2011.pdf
11. CUHK Aviation Policy and Research Center Commentary (28/7/2011):機場噪音
應如何評估
http://www.baf.cuhk.edu.hk/research/aprc/word/CK31NoiseMeasurement_28July2011.pdf
12. European Commission, Climate Action, Policies of transport (Aviation)
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<http://www.ipcc.ch/pdf/special-reports/spm/av-en.pdf>
15. Pew Center on Global Climate Change (2009)—Greenhouse Gas Emissions from
Aviation and Marine Transportation: Mitigation Potential and Policies
<http://www.c2es.org/docUploads/aviation-and-marine-report-2009.pdf>

Books

1. **Besanko, David and Ronald Braeutigam.** 2011. *Microeconomics* (4th Edition).
John Wiley and Sons (Asia) Pte Ltd.
2. **Frank, Robert H. and Ben S. Benanke.** 2009. *Principles of Economics* (4th Edition).
New York: McGraw-Hill Irwin.
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