

Dominant Carrier Performance and International Liberalisation: The case of North East Asia

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1. Introduction

Numerous studies on the aviation industry have confirmed that significant benefits can be brought by liberalizing the international market. After a comprehensive review of the recent studies on this issue, Fu and Oum (2014) concluded that there is strong evidence that liberalisation introduces substantial economic benefits to the countries involved. In the airline industry, liberalisation has led to increased airline competition, decreased average fares, increased frequency, improved load factor and airline productivity, increased traffic volumes and new route services. These changes not only lead to higher employment and economic output in the aviation industry, but also provide better inputs to other related sectors such as tourism, trade and logistics. Yet despite such well recognized benefits, mostly developed countries have liberalised their air service agreements, notably the United States followed by the EU. As of 2003, 57 liberalisation agreements out of 87 involved the U.S. As of October 2012, over 400 liberalized agreements were reached among 145 economies, among which more than 100 were U.S. open-skies agreements (ICAO 2013). In most other markets, air liberalisation has made limited progress over the past decades, even in regions characterized with strong economic and international trade growth.

Some limited progress in aviation liberalisation has been achieved in the North East Asia (NEA) region. In 2006, an open skies agreement was endorsed between Korea and the Shandong province in China. In 2007 Korea and Japan achieved bilateral open-skies agreements with the exception of Japanese metropolitan airports that suffer from capacity constraints. An agreement to liberalize the services between Tokyo Narita International Airport and Incheon International Airport was subsequently reached in 2010, after the airport capacity was expanded in Tokyo. All these achievements have led to substantial growth in aviation traffic and service frequency. However, compared to the market potential of this region, which comprises of the world's second, third and fifteenth economies in terms of GDP (i.e. China, Japan and Korea¹) and a total population of more than 1.5 billion, it is clear that the international aviation market in NEA could have been much larger if more liberalized bilateral service agreements had been reached. Therefore, there is a need to investigate why governments in this region have not been able to achieve more and whether a clear roadmap can be designed in order to push liberalisation forward on a fast track in the years to come.

Despite an increasing body of literature on air transport liberalisation in recent years, limited attention has been devoted to dominant airlines' performance changes throughout the liberalisation process, and how the competitiveness of a country's aviation sector influences its government's policy on international transport. This is justified in theory since national policy such as air transport liberalisation should be based on the overall national interests instead of individual firms' well-being. In practice, however, dominant airlines often exert significant influences throughout the liberalisation process. This is not a new issue It dates back to the time when the current international system was first introduced. The United States urged for liberal international markets after World War II. However, most other countries had reservations over full liberalisation, partly due to concerns that their airlines could not compete with those in the United States on almost every aspect including fleet development, availability of qualified pilots, management expertise and financial resources.

1 At 2012 current price in US dollars, based on the estimates by the United Nations Statistics Division.

The preamble to the 1944 Chicago Conference aimed to promote international aviation "in a safe and orderly manner" on the basis of equality of opportunity. In 1946 the Bermuda Agreement was reached between the U.S. and Great Britain subsequently, and bilateral service agreements (BSAs) were formed. This generally led to compromises which allowed liberalisation of the international markets without jeopardizing the well-being of "flag carriers". Such practices and philosophies prevailed until governments in the U.S. and Western European countries began to liberalize their skies in the early 1990s. At that time the concept of "flag carrier" was phasing out and governments had no or little direct interests in their airlines. This is not the case in the NEA region. Other than a few niche players such as Spring Airlines and Juneyao Airlines, most airlines in China are majority owned by either central or local governments. Although the Chinese government recognized a "decisive role" to be played by markets in allocating resources², there is still no clear separation between its dual-role as the owner of airlines and as a regulator. Influences from the dominant airlines in China on various aviation policies will not fade away quickly.

In addition, investigations on major airlines' performances, both overall and domestic market development, will help predicting their performance in the international markets, thus that their strategy in developing international markets, and their attitude toward alternative liberalisation policies can be examined. Many studies have discussed the relationship between domestic market structure and export services. With some simplification, the literature on this could be divided into two streams. On one hand, the national-champion theory argues that with suppressed competition in domestic markets, firms can achieve large scales which enable them to obtain large market shares and profits in export markets (see for example Pagoulatos and Sorensen, 1976; Marvel, 1980; Krugman, 1984; Chou, 1986). Another group of studies support the competition theory in that tight competition in the domestic markets forces firms to improve and innovate which enables them to achieve global competitiveness in the export market (see for example Audretsch and Yamawaki 1988; Porter 1990; Clark et al. 1992; Kim & Marion, 1997; Sakakibara and Porter, 2001). Clougherty and Zhang (2009) examined the case of airline markets and found that if an airline can improve its performance in the domestic market, it is more likely to win competition in the overseas markets.

This paper aims to investigate the linkage between domestic market regulation/deregulation, airline performance and liberalisation of international markets in the NEA region, with a focus on the Chinese market for apparent reasons: China is the world's second largest aviation market after the United States, and thus, its liberalisation policy will introduce significant impacts on the NEA region as well as on the global aviation market. Japan and Korea have made major progress in opening up their markets to each other and a few other states. In comparison, the Chinese government has been more conservative towards liberalisation after some opening-up efforts in 2007, when the bilateral service agreement between China and US allowed more flight frequency designations.

Airlines in Korea and Japan have been privatized for quite some time, yet dominant carriers in China are still majority owned by state. Such close linkages with the government may allow Chinese carriers to exert greater influence over national policies despite some deregulation policies implemented over the years, legacy regulations are still present in the Chinese domestic markets. If such regulations limit airline competition and cannot be phased out in domestic markets, they are unlikely to be removed in the international market any time soon. In summary, an examination of the development status in the Chinese domestic market, in particular major airlines' performances, will contribute to a better understanding of Chinese regulator's aims and priorities. Such a study helps outsiders to predict regulators' policy preferences in the years to come. For the reasons mentioned above, this study will focus on the aviation

2 Decision made at the third plenary session of the 18th Communist Party of China Central Committee, held in Nov 2013.

market in China whereas the case of Korea and Japan will be briefly discussed only if it is necessary to benchmark across all three countries.

This paper is organized as follows: Section 2 reviews the development path and current status of aviation markets in the NEA region, including domestic deregulation, international liberalisation efforts and major airlines' performance. Section 3 discusses possible concerns of the Chinese government if a "national champion" philosophy is adopted to help major carriers achieve a large scale and global competitiveness. Section 4 reviews the development status of LCCs in the region, and whether they can promote aviation liberalisation in the NEA region without generating substantial market disruptions. The last section summarizes and concludes.

2. Domestic market development and status of major airlines

In the past few decades, the Chinese aviation sector has achieved tremendous growth thanks to the country's fast-expanding economy and huge investments in transport infrastructure including airports and air traffic control systems. In terms of market size, the number of air passengers grew at an annualized rate of 14.9% between 1990 and 2010.

It is not straightforward to measure the performance and competitiveness of Chinese airlines. In 2010 the total earnings of Chinese carriers reached RMB35.1 billion (USD5.18 billion), about 60% of the industry's global profit that year. On the other hand, China Eastern Airlines, the second largest carrier in the country, received a government capital injection of 10 billion RMB (US\$1.45bn) in 2009, and another injection of more than 3 billion RMB (US\$0.44bn) in 2012 to reduce its exceedingly high debt ratio. The other two largest airlines, China Southern and Air China, received capital injections of 2 billion RMB (US\$0.29bn) and 1 billion RMB (US\$0.15bn) respectively in 2012 as an urgent measure to boost capital and reduce debt. During this period, there were no major disruptive events such as SARS or terrorist attacks in China. Although Chinese airlines have been growing rapidly in terms of scale, their performances can be two-sided and need to be examined. This section reviews the market structure and development path in the Chinese aviation market, thus that the performance of Chinese carriers can be interpreted and their attitude towards deregulation and liberalisation can be evaluated.

The development path of Chinese domestic market

The Chinese aviation industry was operated as a quasi-military unit before 1978. Commercialization of airlines started in March 1978, when management/regulatory authority was transferred from the air force to the State Council. However, airlines were only corporatized in 1987, when six major state-owned airlines were formed based on six regional bureaus: the following Air China, China Southern, China Eastern, China Southwest, China Northwest, and China Northern. Since 2002, some major restructuring policies were introduced in the aviation sector:

- The Chinese government initiated market consolidation among major carriers. In 2002, China Eastern Airlines merged with China Northwest and Yunnan Airlines; China Southern merged with China Northern and Xinjiang Airlines; and Air China merged with China Southwest and CNAC Airlines. In 2010, the market was further consolidated, when China Eastern acquired Shanghai Airlines and Air China acquired Shenzhen Airlines. In addition, consolidated airlines also established many subsidiary carriers, often jointly with local governments, which serve as niche players in regional markets. For example, Air China holds shares in Shandong Airlines, Tibet Airlines, Dalian Airlines, Air China Inner Mongolia and Air Macau. The same strategy has been adopted by other major airlines such as China Southern, China Eastern and Hainan Airlines. In summary, the Chinese government has allowed coordinated mergers and consolidation in the airline market. Competition or anti-trust issues have not been a serious concern to the regulator.
- The preference for scale and government control in China is also reflected in the input supply market. The China National Aviation Fuel (CNAF), a fortune 500 company, is the *de facto* monopoly supplier of aviation fuel in China although some airlines have limited control of fuel supply in a few domestic airports. The China Aviation Supplies Holding Company, another state-

owned company, has a significant market share in aircrafts purchase and leasing. The China Travel Sky Holding Company provides the IT backbone for domestic ticket sales and reservations, and has been providing airport passenger systems for over 100 airports. Since 2002, the six groups (i.e. Air China, China Eastern and China Southern airline groups, CNAF, China Aviation Supply and China Travel Sky) are “detached” from the Civil Aviation Administration of China (CAAC) thus that they are under the control of the State-owned Assets Supervision and Administration Commission of the State Council. Still, ties between CAAC and these state-controlled groups remain strong. Many senior officials at CAAC actually served as top executives at these six groups.

- Provincial and municipal governments play significant roles in the aviation industry. Other than the Beijing Capital Airport and airports in Tibet, all airports had been transferred to local governments by 2004. Local governments are responsible for airport investments, although airport operation and pricing are regulated by the central government. Airports are classified into different “categories” Each category is under a set of pricing schemes as defined by CAAC. In addition, many second-tier airlines (in terms of size) are founded/co-founded by local governments, mainly to promote aviation services to the province or the city. Therefore, local governments’ interests and objectives are usually consistent with their own airports, but not always consistent to those of the other airlines. That is, airlines care more about their own revenues and profits, while local governments care more about traffic volume and service quality in their regions since better aviation services contribute to the well-being of local airports and economies.

Compared to the aviation markets in developed economies, the commercialization process of the Chinese aviation markets started much later. Currently, all major carriers are majority owned and managed by either central or local governments. Many inputs and supporting services are also controlled by state-owned companies that have significant market power. The central government owns the largest three airline groups and dominant/monopoly companies that provide fuelling services, ticketing and airport IT services, fleet purchasing services. The regulator has little concern over market consolidation and reduction of competition. Only a few private airlines have been allowed to enter the market and they are still much smaller than their state-owned peers. Most airports are under the control of local governments, which are responsible for these airports’ financial performance and infrastructure investments. Therefore, these local governments may have different objectives than the dominant carriers as local governments care for better aviation services in their respective regions, which benefit local airports and increase social welfare.

Airline route entry, network development and airline competition

Route and network planning is very important since they directly affect airlines’ cost and revenue. Piermartini and Rousova (2008) reviewed Air Service Agreements (ASAs) in international markets and found that although 60 percent of the ASAs allow multiple designations, 40 percent permit only single designation thus that there are at most two airlines competing in the international routes involved. Fu et al. (2010) and Fu and Oum (2014) concluded that liberalisation allows airlines to optimize their networks for various objectives: to improve cost efficiency by exploiting “economies of traffic density”, to enhance service quality by initiating direct flights and/or by increasing flight frequency, to price more aggressively or to compete more strategically. Regulation on route entry has been removed in most mature markets in North America and Europe, as well as Asia-Pacific countries such as Japan, Korea, Australia, New Zealand etc.

In the Chinese domestic markets, route entry and airport slot allocations are monitored and/or regulated depending on whether hub airports are involved. The detailed regulation rules have evolved over the years. Currently, when airlines plan to enter a new market defined as an airport-pair, they need to either apply for approval or simply register/report in advance. The following three types of route entry need to be approved: (I) when the entry involves an airport that is slot controlled or capacity constrained as defined by

the regulator, or (II) when the entry involves busy airports or routes with large traffic volume, or (III) airports that have special arrangements related to safety of flight operations. For the following three types of route entry an airline only needs to register/report in advance without seeking an approval: (1) airport pairs not included in I-III as outlined above, or (2) cargo flights, or (3) airport pairs defined by CAAC or regional bureaus.

Before 2010, approval for route entry is required for most large airports in provincial capital cities and metropolitan areas. Under the current rules, entries involving the four airports in Beijing, Shanghai and Guangzhou (i.e. Beijing Capital Airport, Shanghai Hongqiao Airport, Shanghai Pudong Airport and Guangzhou Baiyun Airport) need to be approved. However, for airlines which have their hubs located in these four airports, there is no need to seek approval for flights from their hub to other destinations not involving the four regulated airports. For example, since Air China has its hub at Beijing, there is no need to seek approval for flight between Beijing – Xi'an, but the carrier needs to apply for adding frequency between Beijing – Shanghai. As of Dec 2013, 88% of the entry rights to 3,353 domestic routes are by registration only without the need to seek formal approval. This ratio has been increasing over the years.

In addition to route entry regulation, there are also slot controls at congested airports. Airport slot allocation and coordination are under the control of the central government (i.e. CAAC) as well as regional bureaus. Regional bureaus are responsible for domestic airlines' flights at the airports, whereas CAAC coordinates slots for international flights. Since traffic volumes have outpaced airport capacity growth to many destinations, more and more airports needed slot coordination in recent years as reported in the following Table 1:

Table 1. **Airport Slot Control and Coordination of Chinese Airports**

Airport	Peak-hour Movement Limit (per hour)	Coordinated Time Period	Effective Since
Beijing	88	06:00—02:00	2011.12.15
Shanghai Pudong	65	06:00—02:00	2010.5.1
Guangzhou	58	06:00—02:00	2010.3.28
Xi'an	45	06:00—02:00	2012.5.7
Shanghai Hongqiao	43	06:00—02:00	2010.5.1
Chongqing	42	06:00—02:00	2012.5.25
Shenzhen	34	06:00—02:00	2011.2.9
Chengdu	34	06:00—02:00	2012.3.25
Wuhan	33	06:00—02:00	2012.3.25
Hangzhou	31	06:00—02:00	2012.3.25
Nanjing	28	06:00—02:00	2012.3.25
Qingdao	28	06:00—02:00	2012.3.25
Xiamen	28	06:00—02:00	2011.2.9
Dalian	27	06:00—02:00	2012.5.25
Changsha	27	06:00—02:00	2011.2.9
Haikou	27	06:00—02:00	2011.2.9
Urumqi	25	08:00—04:00	2011.8.15
Tianjin	24	06:00—02:00	2011.1.13
Fuzhou	23	06:00—02:00	2011.2.9
Sanya	20	06:00—02:00	2011.2.9

Source: authors

When a regional bureau manages airport slots, an allocation committee is formed by representatives from the regional bureau, regional air traffic control, airlines and the airport. One key responsibility of this committee is to suggest the slot allocation ratio between hub carriers vs. airlines based in other airports. For major decisions, a vote will be conducted among committee members, which have a total of 1,000 voting rights. Based on the shares of allocated slots in the previous year, a total of 600 votes are distributed among airlines. The rest of the voting rights are shared among regional bureaus, airports and air traffic control agencies. Through routine operation and management, airport slots are allocated among the following services with a decreasing priority:

- Existing flights (i.e. grandfather rights)
- Entrant airlines initiating services at the airport
- Hub carriers having priority over non-hub carriers.
- New routes by airlines currently serving the airport.
- Airlines that achieved high utilization rates of current slots.

In view of the current practice in the global aviation industry, the airport slot allocation regulations in China are not totally unreasonable. In mature markets such as Europe and North America, the first step of slot allocation is to give priorities to incumbent airlines with existing slots to obtain the same slots in the next period (grandfather rights). If the existing slots are to be protected for the next period, the slots have to be used at least 80% of the time in the current period (“use it or lose it” rule). Once the grandfather rights are confirmed, the remaining slots together with newly created slots (through improved air control technology, voluntary relinquishment, insufficient use or added capacity) are grouped in a ‘slot pool’, up to 50% of which are set aside for new entrants (“new entrant” rule). The rest is allocated free of charge to incumbents. The current slot allocation approach adopted in many countries, characterized by “grandfather rights”, “use it or lose it” rule and “new entrant” rule, however, has long been criticized for inefficient allocation, and is recognized as a source of congestion both in the academic literature and by the aviation industry (Matthews and Menaz, 2003). For example, an incumbent airline may deter entrant airlines by scheduling small aircrafts over non-core routes or to lease slots to alliance members for a short period, thus that incumbent airlines can continue to hold to slots that are under-utilized. With this kind of “slot baby-sitting” strategies, incumbent airlines may deter entrant airlines by pre-empting the markets via airport slots hoarding. Many studies, including these commissioned by governments, have investigated using slot auction or other possible market-based instruments (e.g., congestion pricing, slot sales and slot trading), thus that slots are allocated to carriers that attach the highest economic value to them (DotEcon 2001, 2006; Sentence 2003; Maldoom 2003; National Economic Research Associates 2004, Madas and Zografos, 2006, 2008, 2010, Brueckner 2009, Verhoef 2010). However, these proposals have largely remained on paper due to various practical challenges and political concerns. For example, the US Department of Transportation planned to auction slots for airports in New York, but was eventually forced to postpone the plan indefinitely due to resistance from airlines and the Port Authority of New York and New Jersey which manages the airports involved.

Still, the regulations on route entry and airport slot allocation in China jointly are much more restrictive than the regulations adopted in mature markets such as Europe and North America (e.g. London Heathrow airport, JFK, Chicago O’Hare etc.). In these deregulated markets there is only slot control in congested airports. Once a slot is secured and used by an airline, it can be used for any route without seeking approval. In contrast, Chinese airlines often need to secure approvals for both route entry and airport slots when they enter or add frequencies in routes linking to hubs in metropolitan areas (i.e. Beijing, Shanghai and Guangzhou). In addition, whereas it has been a common practice in mature markets to give priorities to entrant airlines and new services, in the Chinese domestic markets hub carriers receive preferential treatments: other than the four regulated airports, there is no need for hub carriers to seek route

entry approval for initiating services to their own hub airports. In addition, these carriers also have higher priority in securing airport slots at their hubs. It has been claimed by the regulator that these policies are aimed to achieve two objectives: to promote competition and to facilitate dominant airlines developing their hubs. However, the preferential treatments given to hub carriers make it difficult for other airlines to compete in major hubs. This is in sharp contrast to the policies adopted by the US Department of Transport, which has tried to introduce competition in hub airports and to discipline hub carriers' market power³.

Performance of aviation markets and major airlines

There is a two-way relationship between government policy and market performance in China. On one hand, aviation policies have been revised over the years to reflect the changing market conditions and to achieve evolving policy objectives. On the other hand, these policies have brought significant influences to the market equilibrium and thus airlines' performances. For example, large airports in China accounted for a significant proportion of the national markets, and thus special arrangements have been made with respect to route entry and slot allocation at these airports. Because government policies have given preferential consideration to hub carriers, they have been able to further strengthen their market positions at major hubs as well as in the national market. The market shares of the top 10 major airports are reported in the table below for the 1998-2009 period. Over the years, the top 10 airports have accounted for more than half of the national passenger market and more than 70% of the national cargo markets. As a result, it is of critical importance for airlines to secure their market shares at major airports.

Table 2. Market Shares of the Top-10 Chinese Airports

Market Share by Passenger Volume (Unit %)						
Year	09 Rank	2009	2008	2005	2002	1998
Beijing	1	13.45	13.79	14.42	15.85	15.23
Guangzhou	2	7.62	8.24	8.28	9.34	10.92
Shanghai / Pudong	3	6.57	6.7	8.32	6.45	N/A
Shanghai / Hongqiao	4	5.16	5.64	6.26	7.98	12.05
Shenzhen	5	5.04	5.27	5.73	5.46	4.53
Chengdu	6	4.66	4.25	4.89	4.40	3.86
Kunming	7	3.90	3.91	4.16	4.14	4.33
Xi'an	8	3.15	2.94	2.79	2.59	2.52
Hangzhou	9	3.07	3.12	2.85	2.26	2.00
Chongqing	10	2.89	2.75	2.33	2.26	2.07
Total		55.51	56.61	60.03	60.73	57.51

3 Many studies on the US aviation markets have found that dominance at an airport allows a carrier to achieve substantially higher mark-up above cost, a benefit known as the "hub premium" in the literature (Borenstein 1989; GAO 1989, 1990). The U.S. Department of Transportation (DOT, 2001) believes that it was the lack of price competition, not those other rationales, that explained high prices at hub markets. Therefore, it is required that each of the large airports with a "dominant" carrier must submit to the U.S. Department of Transportation (DOT) a plan on how they intend to promote airport access, entry and competition (FAA, 1999). The requirement of submitting a competition plan was incorporated into the "Wendell H. Ford Aviation Investment and Reform Act for the 21st Century" legislated in 2000. According to this Act, large and medium airports that exceed a certain threshold of concentration are required to submit competition plans.

Market Share by Cargo Volume (Unit %)						
Year	09 Rank	2009	2008	2005	2002	1998
Shanghai / Pudong	1	26.9	29.5	29.3	15.8	N/A
Beijing	2	15.6	15.5	12.4	15.7	17.7
Guangzhou	3	10.1	7.8	9.5	12.4	14.1
Shenzhen	4	6.4	6.8	7.4	7.2	4.0
Shanghai / Hongqiao	5	4.6	4.7	5.7	10.9	19.8
Chengdu	6	4.0	4.2	4.0	4.0	3.8
Kunming	7	2.7	2.7	3.1	3.0	3.5
Hangzhou	8	2.4	2.4	2.6	2.2	1.9
Nanjing	9	2.1	2.1	2.2	1.3	1.1
Xiamen	10	2.1	2.2	2.5	2.7	3.3
Total		76.92	77.9	78.70	75.20	69.20

Source: Fu et al. (2012)

Note: Shanghai Pudong International Airport was in service on 1 Oct 1999

The overall effects of route entry and slot allocation have been unclear. As shown in the following tables, the increases in flight frequency have been substantial although significant variations exist among airports of different sizes. However, average aircraft size for flights linking the largest airports actually decreased from 2002 to 2008. This might indicate the progress of Chinese carriers in constructing hub-and-spoke networks (which requires extensive feeder operations using small aircrafts), or increased airline service quality with reduced schedule delay. On the other hand, it may be an indication that precious airport slots could have been better utilized with larger aircrafts, or the current slot allocation scheme is not optimal from the perspective of social welfare. In addition, Wang et al. (2014) noted that Chinese carriers' yields at the largest routes are slightly higher than the average yield in the United States. Considering the lower per capita income and input prices in China, airline competition in China is certainly not at the level it should have been.

Table 3.1 Average aircraft size on routes between different sized airports

2002			
	Top 10 airports	Airports ranked 11-50	Other airports
Top 10 airports	182 (33.14)	148 (35.92)	113 (49.30)
Airports ranked 11-50		123 (48.69)	91 (55.66)
Other airports			155 (50.28)
2008			
	Top 10 airports	Airports ranked 11-50	Other airports
Top 10 airports	166 (32.05)	146 (21.48)	115 (43.82)
Airports ranked 11-50		134 (38.44)	100 (51.40)
Other airports			85 (55.26)

Source: Wang et al. (2014)

Note: Numbers in parentheses are standard deviations.

Table 3.2. Weekly average flight frequency on routes between different-sized airports

2002			
	Top 10 airports	Airports ranked 11-50	Other airports
Top 10 airports	78.5 (61.67)	26.8 (27.62)	6.6 (8.30)
Airports ranked 11-50		9.1 (9.20)	7.9 (9.68)
Other airports			3.5 (2.03)
2008			
	Top 10 airports	Airports ranked 11-50	Other airports
Top 10 airports	168.6 (104.41)	50.2 (48.71)	10.6 (14.31)
Airports ranked 11-50		14.8 (16.10)	8.6 (12.73)
Other airports			10.9 (16.59)

Source: Wang et al. (2014)

Note: Numbers in parentheses are standard deviations.

Dominant airlines in China have been able to take advantage of many favourable factors in the past decades: the Chinese economy has been growing at a fast pace, leading to very strong demands for air travel. Such demand growth has been particularly high in major airports, where hub carriers enjoy substantial competitive advantage under the regulatory regimes of route entry and airport slot allocation. The Chinese government has encouraged major airlines to further consolidate, thus that leading carriers were able to increase their scale at remarkable speeds. As shown in Table 4, Chinese airlines have been growing much faster than their peers in the NEA region. During the period of 2001 to 2012, the “big three” Chinese carriers (i.e., Air China, China Southern and China Eastern) recorded about 700% growth in revenue. In comparison, Korean carriers only increased revenues by less than 300%, whereas Japanese carriers’ revenues increased by less than 50%. In terms of the number of passengers carried and the number of aircraft, Chinese carriers were much smaller than their Japanese and Korean competitors in 2001. But in 2012, they were almost twice large as the largest followers in the other two countries. It is clear that Chinese airlines have achieved remarkable growth in size.

Table 4. Benchmark Major Airlines' Performance in NEA

2001	China Southern	China Eastern	Air China	Korean Air	Asiana	Japan Air	ANA
Total Revenue (million US\$ current price)	2,039	1,468	2,747	4,393	1,718	12,095	NA
Total Profit (million US\$ current price)	169	69	115	718	344	-276	NA
Revenue Passenger (1,000)	19,121	10,371	15,600	21,638	11,931	37,183	NA
Number of Aircraft	111	70	114	127	59	173	NA
% of Cargo Revenue	8%	17.20%	15%	27.81%	28.24%	14.90%	NA
% of International RPK	22.40%	NA	46%	88.67%	84.21%	77.23%	NA
2006	China Southern	China Eastern	Air China	Korean Air	Asiana	Japan Air	ANA
Total Revenue (million US\$ current price)	5,797	4,842	5,636	8,455	3,613	19,499	11,769
Total Profit (million US\$ current price)	26	-433	415	1,856	706	-138	230
Revenue Passenger (1,000)	49,206	35,040	33,971	22,353	12,767	57,452	49,609
Number of Aircraft	309	205	225	116	65	NA	NA
% of Cargo Revenue	7.70%	15%	9%	31.36%	27.68%	9.50%	6.21%
% of International RPK	17%	37.80%	48.00%	92.85%	91.50%	65.35%	32.10%
2012	China Southern	China Eastern	Air China	Korean Air	Asiana	Japan Air	ANA
Total Revenue (million US\$ current price)	15,771	13,511	15,981	10,883	5,003	14,509	16,998
Total Profit (million US\$ current price)	808	445	781	1,238	598	2,247	339
Revenue Passenger (1,000)	86,485	73,077	72,416	24,283	15,514	37,564	44,903
Number of Aircraft	491	428	461	142	71	216	230
% of Cargo Revenue	6.60%	10.10%	8.40%	25.27%	25.73%	6.54%	8.59%
% of International RPK	20.80%	30.20%	33.30%	96.19%	94.94%	89.64%	42.30%

Source: Company's annual reports and industry sources

Meanwhile, Chinese airlines were able to increase their profit significantly, albeit slightly slower than the growth in scale. As shown in Table 4, the Chinese “big three” improved their profits by more than 500% from 2001 to 2012. However, they were not able to improve their competitiveness at global markets as predicted by the “national champion” theory – the share of international traffic in terms of PRK actually decreased between 2001 and 2012, which lagged far behind other major network carriers in NEA. Domestic success has not made Chinese airlines able to bridge the gap of competitiveness with other airlines. Wang et al. (2014) benchmarked Chinese airlines' Total Factor Productivity against major network carriers in Europe, Asia and North America. They concluded that although Chinese airlines were able to improve their efficiency significantly, the efficiency differences with North American carriers actually grew, as reported in Table 5.

Table 5. **Gross Total Factor Productivity (TFP) Index of Major Airlines**
(Normalized at American Airlines 2005=1)

Year	China Eastern	China Southern	Air China	Chinese A.V.G	Thai Airways	Singapore	Cathay	American	Delta	United	Continental	Air Canada	North American A.V.G	Lufthansa	Air France	KLM
2001	0.49	0.51	0.50	0.50	0.68	1.12	1.04	0.72	0.77	0.79	0.88	0.76	0.78	0.64		0.85
2002	0.50	0.54	0.53	0.52	0.73	1.01	1.17	0.74	0.81	0.92	0.86	0.79	0.82	0.67	0.71	0.83
2003	0.49	0.50	0.54	0.51	0.66	1.01	1.11	0.85	0.89	0.99	0.98	0.80	0.91	0.65	0.75	0.82
2004	0.60	0.56	0.63	0.60	0.70	1.01	1.10	0.94	0.86	1.07	0.96	0.95	0.95	0.70	0.77	0.94
2005	0.56	0.57	0.68	0.61	0.70	1.10	1.10	1.00	1.01	1.11	0.99	0.91	1.01	0.72	0.89	0.89
2006	0.59	0.61	0.75	0.65	0.74	1.29	1.05	1.04	1.06	1.15	1.03	0.92	1.05	0.71	0.88	0.88
2007	0.63	0.66	0.76	0.69	0.78	1.32	1.03	1.05	1.01	1.14	1.06	0.94	1.05	0.74	0.90	0.90
2008	0.60	0.67	0.64	0.64	0.68	1.32	1.02	0.98	0.75	0.98	1.05	0.95	0.93	0.74	0.92	0.92
2009	0.62	0.68	0.75	0.69	0.74	1.33	1.10	1.02	1.03	1.12	1.09	0.91	1.04	0.71	0.95	0.95
2010	0.71	0.72	0.77	0.74	0.86	1.30	1.11	1.06	1.09	1.09	1.09	1.00	1.07	0.74	0.95	0.95

Source: Wang et al. (2014)

Note: 1. United Airlines and Continental Airlines merged in 2010. Thus the TFP for the two airlines in 2010 is for the new merged airline.

2. Air France and KLM merged in 2005. Thus the TFP for the two airlines from 2005 to 2010 are for the new merged airline.

3. The weight used to calculate the Chinese and North American average TFP is the airlines' revenue share.

In summary, major airports are of critical importance to Chinese airlines due to their large market potential. However, traffic growth has outpaced capacity in these markets, making government regulation on route entry and slot allocation in these markets a critical factor in determining airlines' performances. Whereas route entry regulation has been phased out in all but four major airports in the metropolitan areas, an increasing number of airports is under slot control. The route entry and airport slot allocation mechanisms jointly favour hub carriers' network development, but put other airlines in a significantly disadvantaged position. Overall, flight frequencies have been increasing quickly among all airports, leading to increased service quality and reduced schedule delay to travellers. However, average aircraft size has actually decreased slightly for flights among the largest 10 airports. This may reflect airlines' efforts to build up hub-and-spoke networks, but may also suggest that precious slots are not utilized in an optimal way. Chinese airlines were able to achieve very high yield in dense routes due to insufficient competition in the domestic markets, especially routes linking hub airports.

Thanks to the phenomenal growth in the domestic markets, Chinese carriers were able to grow their scale and profit. However, success in domestic markets did not increase their competitiveness in international markets substantially. Chinese airlines' efficiency is still worse than that of industry leaders, and Chinese airlines' shares of international revenue decreased over the past decades and remained far below their NEA peers. In summary, Chinese airlines are now better positioned to compete globally in terms of scale, but they have not identified a good strategy to fully leverage the favourable management conditions they have been enjoying. The following section will discuss their readiness for global competition, and their attitude towards international aviation policy.

3. Implications of liberalisation to dominant airlines

Many studies have examined the effects of liberalisation using observed industry data. These *ex post* studies found strong evidence that if travellers' well-being and social welfare are considered in addition to airline profits, liberalisation generally brings significant benefits to all the countries involved. In addition, empirical investigations on various sectors including the airline industry have provided convincing evidence that the "national championship" model rarely works and that it is competition that brings innovation and improvements in the long term. Even if the Chinese government still favours such a strategy in the years to come, Chinese airlines should be encouraged to compete in a more deregulated market since they are now among the largest airlines in the world (as shown in Table 4). Few industries, including the airline sector, can become globally competitive through government protection. The Japanese government had for decades given its "national carriers" direct and indirect assistance. However, such a policy has not helped JAL from filing for bankruptcy protection in 2009. Since then, more competition has been introduced in the Japanese domestic and international markets, yet JAL has recently emerged as a stronger airline. Therefore, it is our belief that all three countries in the NEA region should liberalize their skies to maximize the benefits to the overall economy instead of protecting their airlines.

However, due to policy/political considerations beyond economic considerations, NEA governments may stick to their current policy and major airlines may continue to exert significant influences over liberalisation policy. Therefore, in this section we will identify the opportunities and challenges of liberalisation to major airlines in the region in order to identify airlines' preferences and strategies. This would allow us to predict the likely liberalisation process in the short term if public policies are still heavily influenced by major airlines in the years to come. Obviously, such an outcome is likely to be sub-optimal compared to full liberalisation as explained above.

Priority markets and airline performances

The three countries in NEA have experienced different periods of strong growth of their economies and international trade. Japan's economy and export had been quite strong by the early 1960s. Priority was given to the development of North American routes. Both Japanese carriers and US carriers established good networks and high frequency services to the United States. The Korean economy and aviation industry developed in a similar pattern, with major liberalisation agreements signed between Korea and the US after the Asian financial crisis. In comparison, although trade and passenger volumes between China and the US have been growing at extremely high rates since the early 1990s, Chinese airlines' networks to the North America was much slower than that of their Japanese and Korean peers. As shown in Table 6, in year 2001 three Chinese carriers served a total of 3 North American destinations with 23 weekly flights. During the same period, Japanese (and Korea) airlines served 10 (11) destinations with 198 (92) weekly flights. Over the years, Chinese carriers have improved their network developments. As of the first week of July 2014, the numbers of North American destinations and weekly frequency are finally comparable to their competitors in Japan and Korea. Still, since there are more carriers from China than from Japan and Korea (2 airlines each) that serve this market, individual Chinese airline's service is still likely to be inferior to their competitors in the NEA region.

Table 6. NEA Airline Service to North American Destinations

2001	Chinese Carriers	Japanese Carriers	Korean Carriers
Number of Airports	3	10	11
Weekly Frequency	23	198	92
Weekly Seats	8,008	69,771	31,809
Number of Airlines	3	3	2
2006	Chinese Carriers	Japanese Carriers	Korean Carriers
Number of Airports	4	9	11
Weekly Frequency	47	145	100
Weekly Seats	14,252	47,104	34,410
Number of Airlines	3	4	2
2012	Chinese Carriers	Japanese Carriers	Korean Carriers
Number of Airports	7	8	12
Weekly Frequency	87	147	140
Weekly Seats	24,981	39,186	45,049
Number of Airlines	5	3	2
2014	Chinese Carriers	Japanese Carriers	Korean Carriers
Number of Airports	11	11	13
Weekly Frequency	154	189	152
Weekly Seats	42,412	41,446	47,455
Number of Airlines	5	2	2

Source: OAG database for scheduled flights

Note: The number of airports refers to the number of airports served with direct flights.
The first week of July in the sample year is referred for weekly statistics.

Geographic location and airport capacity also play important roles in determining the competition among NEA carriers for services to North America. Without an open-skies agreement between China and the US, a regional NEA open-skies agreement would enable Japanese and Korean carriers to use Tokyo and Incheon as gateway hubs to North America. Indeed, a lot of Chinese passengers are now utilizing connection flights at Seoul.

As reported in Table 7, Chinese carriers' network connectivity to European destinations have been better than other NEA airlines in terms of airports served, weekly frequency and number of seats offered most of the time within our sample period from 2001 to 2014. In addition, in terms of geographic location and market potential, major Chinese airports such as Guangzhou, Chengdu and Xi'an can serve as Asian gateway hubs to Europe. In fact, China Southern has been making good progress in developing the "Canton route" via Guangzhou airport, which could potentially feed traffic from Southeast Asia, Australia and New Zealand to its European services. Since Guangzhou airport has a large capacity and a fast increasing local market, it is well positioned to compete with other Asian hubs such as Bangkok, Singapore or even Dubai in the long term. China Southern may also be able to capture a share of the traffic originally served by the "Kangaroo routes" linking Australia and New Zealand to Europe.

Table 7. NEA Airline Service to European Destinations

2001	Chinese Carriers	Japanese Carriers	Korean Carriers
Number of Airports	9	9	6
Weekly Frequency	39	78	24
Weekly Seats	11,426	26,919	8,904
Number Airlines	3	2	2
2006	Chinese Carriers	Japanese Carriers	Korean Carriers
Number of Airports	12	8	10
Weekly Frequency	96	79	53
Weekly Seats	28,234	25,261	18,040
Number Airlines	4	2	2
2012	Chinese Carriers	Japanese Carriers	Korean Carriers
Number of Airports	19	5	12
Weekly Frequency	181	66	72
Weekly Seats	44,823	21,232	23,859
Number Airlines	4	2	2
2014	Chinese Carriers	Japanese Carriers	Korean Carriers
Number of Airports	20	7	12
Weekly Frequency	219	88	82
Weekly Seats	54,801	18,151	23,778
Number Airlines	4	2	2

Source: OAG database for scheduled flights

Note: The number of airports refers to the number of airports served with direct flights.
The first week of July in the sample year is referred for weekly statistics.

For international network development in Asia and Oceania, Chinese and Korean airlines performed better than Japanese airlines. As shown in Table 8, as of 2012 and 2014, Korean carriers served more destinations, whereas Chinese airlines provided more frequent services and more scheduled seats. Japanese carriers consistently lagged behind other NEA airlines. This is probably due to their high costs, which make them less competitive when serving relatively price-sensitive consumers. In addition, Japanese carriers serve a fewer number of cities in China compared to their Korean competitors. More investigations are needed to identify the key causes for Japanese carriers' limited network coverage in Asia and Oceania.

Table 8. NEA Airline Service to Destinations in Asia and Oceania
(International markets only)

2001	Chinese Carriers	Japanese Carriers	Korean Carriers
Number of Airports	43	25	55
Weekly Frequency	735	471	454
Weekly Seats	145,694	140,318	118,803
Number Airlines	11	6	2
2006	Chinese Carriers	Japanese Carriers	Korean Carriers
Number of Airports	55	28	83
Weekly Frequency	1,277	638	826
Weekly Seats	235,298	166,689	214,628
Number Airlines	8	5	2
2012	Chinese Carriers	Japanese Carriers	Korean Carriers
Number of Airports	78	30	97
Weekly Frequency	2,036	669	1,526
Weekly Seats	353,838	133,473	338,856
Number Airlines	12	3	7
2014	Chinese Carriers	Japanese Carriers	Korean Carriers
Number of Airports	84	31	101
Weekly Frequency	2,479	771	1,637
Weekly Seats	436,846	165,452	356,215
Number Airlines	14	4	7

Source: OAG database for scheduled flights

Note: The number of airports refers to the number of airports served with direct flights.
The first week of July in the sample year is referred for weekly statistics.

In summary, Japanese and Korean carriers have better network coverage to destinations in North America, whereas Chinese airlines are better positioned for services to Europe. For aviation services to Asia and Oceania, Japanese airlines lag behind Chinese and Korean carriers. Therefore, Chinese airlines are likely to have the following preferences concerning aviation policy

- Chinese airlines will be less resistant towards bilateral liberalisation with ASEAN countries, Australia and New Zealand for several considerations: a more liberal regional market will help Chinese airlines to develop their hubs, notably Guangzhou and in the long term Chengdu as gateways to Europe. Meanwhile, other than Singapore Airlines and Qantas, few network carriers can compete with Chinese airlines over European destinations. Therefore, bilateral liberalisation with these countries will not introduce significant competitive pressure to Chinese airlines, while helping significantly for developing connecting passenger markets between these countries and Europe.
- In the absence of open-skies agreements with the US and Canada, Chinese airlines may have some concerns in creating a single aviation market with Korea and Japan: Japanese and Korean carriers have good network coverage to North American destinations, which allows them to feed traffic from China and the rest of Asia to their gateway hubs in Incheon and Tokyo. In addition, since

there are many more airports in China than Japan and Korea, liberalisation will bring some network benefits to airlines in Japan and Korea, as they will be able to connect many more spoke markets to their hubs. Similar observations have been made by Lau et al. (2012). Their study found that when direct air services were allowed across the Taiwan Straits, airlines in Taiwan were able to improve their networks more than carriers in mainland China.

Performance of major airports and effects on hub airlines

In addition to airlines, major airports can exercise considerable influences over national policy on liberalisation. The connectivity and competitiveness of a major hub also has positive effects on its hub carrier's development. The performances of major hubs in the NEA region are reported as in Table 9. Unlike analysis in the above section on airlines, in this table all airlines' services, including both domestic and foreign carriers at an airport are reported.

Table 9. Hub Airport Performance Benchmarking

2001	Shanghai Pudong (PVG)	Shanghai Hongqiao (SHA)	Beijing (PEK)	Guangzhou (CAN)	Seoul (ICN)	Tokyo (NRT)
Number of Asia-Oceania Destinations and weekly Frequency	6 / 37	19 / 268	17 / 247	14 / 94	63 / 697	33 / 529
Number of European Destinations and weekly frequency	5 / 27	-	15 / 80	-	8 / 46	13 / 151
Number of North American Destinations and weekly frequency	4 / 30	-	4 / 24	1 / 4	11 / 116	18 / 345
Other	-	-	2 / 3	-	1 / 2	1 / 1
2006	Shanghai Pudong (PVG)	Shanghai Hongqiao (SHA)	Beijing (PEK)	Guangzhou (CAN)	Seoul (ICN)	Tokyo (NRT)
Number of Asia-Oceania Destinations and weekly Frequency	38 / 750	-	29 / 448	20 / 221	87 / 1126	43 / 880
Number of European Destinations and weekly frequency	12 / 111	-	16 / 147	3 / 16	10 / 81	13 / 168
Number of North American Destinations and weekly frequency	5 / 45	-	7 / 61	1 / 7	11 / 130	19 / 341
Other (Intl)	-	-	4 / 15	1 / 3	2 / 11	1 / 3
2012	Shanghai Pudong (PVG)	Shanghai Hongqiao (SHA)	Beijing (PEK)	Guangzhou (CAN)	Seoul (ICN)	Tokyo (NRT)
Number of Asia-Oceania Destinations and weekly Frequency	48 / 985	5 / 139	41 / 656	34 / 423	101 / 1775	48 / 935
Number of European Destinations and weekly frequency	16 / 190	-	25 / 210	11 / 66	23 / 185	26 / 271
Number of North American Destinations and weekly frequency	9 / 90	-	10 / 106	2 / 12	13 / 175	18 / 320
Other (Intl)	4 / 30	-	11 / 58	5 / 36	5 / 32	4 / 17
2014	Shanghai Pudong (PVG)	Shanghai Hongqiao (SHA)	Beijing (PEK)	Guangzhou (CAN)	Seoul (ICN)	Tokyo (NRT)
Number of Asia-Oceania Destinations and weekly Frequency	56 / 1168	6 / 136	48 / 660	39 / 449	102 / 2009	49 / 962
Number of European Destinations and weekly frequency	12 / 161	-	24 / 210	5 / 45	14 / 145	16 / 136
Number of North American Destinations and weekly frequency	11 / 130	-	13 / 148	2 / 14	14 / 203	20 / 338
Other (Intl)	7 / 46	-	11 / 56	8 / 41	6 / 34	4 / 25

Source: OAG database for scheduled flights

Note: Weekly data are the data of first week in July for each selected year.

As evidenced in Table 9, for comparisons related to hub airports connectivity:

- Although Japanese carriers' network connectivity in Asia and Oceania lagged behind its NEA competitors, thanks to foreign carriers' frequent services Narita has a comparable connectivity to most NEA hubs as Incheon. Several factors have contributed to Incheon's superior network connectivity: the Korean government has actively promoted aviation liberalisation in recent years. In addition, Korean government's hub policy restricts international services to Seoul Gimpo airport. In the long term, such a policy should be relaxed to allow more international LCC services at Gimpo. This issue will be discussed in Section 4.
- For European destinations, Beijing is far ahead of other hubs with 24 airports connected via direct flights, followed by Narita (16), Incheon (14), Shanghai Pudong (12) and Guangzhou (5). Given Beijing's large market potential and national capital status, such an advantage is likely to persist in the years to come. However, geographically Guangzhou Baiyun airport is better positioned to serve as a European gateway. Although China Southern has made good progress in developing its "Canton routes" in recent years, Guangzhou airport still has a long way to go. This implies that this airport may be more supportive to liberalisation policies, which allows more frequencies and destinations to be added by both domestic and foreign carriers.
- When foreign carriers' services are taken into account, airport development analysis will be very different from those carried out for major airlines at a national level. All three international hubs in China (i.e. Beijing capital airport, Shanghai Pudong airport and Guangzhou Baiyun airport) have superior connections to North America compared to Incheon and Narita in terms of number of destinations and weekly frequency. This probably explains why US carriers have hoped for bilateral liberalisation with China, which could allow more destinations and frequencies to be added. There are significant demands for passenger and cargo flow between the world's two largest economies. Protecting home carriers in this market will not only prevent consumers from enjoying better services, but also prevent NEA airlines from optimizing their networks in the region.

Liberalisation policy preference of Chinese airlines and hub airports

As discussed in the introduction, in the NEA region airlines have significant influence over their nations' aviation policies. With the on-going process of airport privatization, commercialization and localization, major hubs are also gaining more attention from local/central governments. As a result, the strategy and preference of major airlines and hub airports will be taken into consideration when regulators design national aviation policy. Of course, other factors such as political relationships among countries, trade negotiations and pacts may all change the liberalisation process dramatically. Yet, a good understanding of the strategies by airlines and airport (vested interests) will help us predict the likely aviation policies that governments will adopt.

In terms of home carriers' performance and network connectivity, Chinese airlines' services to North America still slightly lag behind other NEA carriers. In addition, geographic locations of Incheon and Narita airports made them ideal gateways for traffic between Asia and North America. Regional liberalisation among NEA countries will allow Japanese and Korean carriers to compete in the China – US routes by feeding traffic to their own hubs. Therefore, major Chinese airlines are unlikely to be passionate with such a liberalisation policy. Instead, they may be less resistant to liberalisation packages with EU and rest of the Asia and Oceania. Chinese airlines' services are relatively well established for European destinations, and they may develop major airports at Guangzhou and Chengdu as gateways to Europe by adding more feeder routes from Asia and Oceania. In addition, other than Singapore Airlines and Qantas, there are no other strong network carriers in the region. Therefore, if the Chinese government will continue its policy support to major state-owned carriers such as the "big three", liberalisation with ASEAN

countries, Oceania and Europe countries will have a higher priority than creating a single aviation market in the NEA region.

When foreign carriers' services are also considered, however, hub airports in Chinese metropolitan areas are better positioned to become gateways to both Europe and Oceania than Incheon and Nartia, and their competitiveness to North America will also be strengthened significantly. Recent studies suggest that dominant airlines' development and vertical arrangements with airports will affect market equilibrium in the aviation markets, and thus, there are inter-active dynamics between hub carrier performance and airport development (see for example Barbot 2009; Fu and Zhang 2010, Zhang et al. 2010, Fu et al. 2011 and Homsombat et al. 2011). This implies that Chinese carriers have not fully leveraged the market potential and domestic dominance at their hubs to develop international services. This has prevented these hub airports to achieve their full potential too. In comparison, Incheon airport has quickly established itself as an important international gateway thanks to Korea's liberalisation policies in recent years and its hub airlines' international expansions. Although there are positive dynamics between major airports and their hub carriers policies protecting home airlines may actually constrain rather than strengthen the competitiveness of airports. Although Chinese hub airports currently have less influence on international aviation policy, in the long term they may become more empowered supporters of liberalisation.

In the short term, there is a high chance that major airlines in the NEA region, especially those in China, will continue to exercise the most significant influences over their nation's liberalisation policies. While it is our belief that governments should put higher priority over consumer well-being and national interests in the long run, one immediate strategy for making progress on liberalisation is to promote LCC services in the region. The following section evaluates the possible effects of such a policy option.

4. Liberalisation by facilitating low cost carrier services

A few LCCs were long established in the NEA region but most of them have been newly created in the last couple of years. In Korea and Japan, many new entrants are affiliated with incumbent network carriers. In certain markets, such ownership structures may help LCCs to secure approval for route entry and airport slots. In addition, the study by Homsombat et al. (2014) on the Australian domestic market reveals that a “dual-brand” strategy of jointly offering network carrier service and LCC service may bring competitive advantage to an airline group. However, such ownership/affiliation arrangements could lead to complications in the future, as network carriers may block the entry of foreign LCCs to undercut these LCCs’ parent airlines. So far, many LCCs have chosen to form local joint ventures when expanding their businesses in another country. Such a strategy has been adopted by AirAsia and Jetstar when they enter markets such as Thailand, Philippines and Japan. Another more direct strategy of overseas expansion is to serve foreign destinations under rules set by bilateral service agreements. In this section we will focus on such an approach.

Promoting LCC services in the NEA region could be a good alternative for full liberalisation in the medium term. In order to cut costs, LCCs usually provide no-frill point-to-point services in short/medium distance markets. Connection services are normally not offered since they will significantly increase baggage handling costs and turn-around times at airports. As a result, improved LCC services will not significantly change the competition among network carriers in inter-continental routes. In addition, whereas route entry and slot allocation at hub airports are closely monitored, regulators and major carriers are usually not concerned with LCCs’ expansion at regional airports. In fact, local governments welcome new services which improve their airports’ connectivity and contribute to regional economy. Since LCCs’ low cost bases allow them to serve thin markets which would otherwise be infeasible for network carriers, there will be relatively moderate disruption of the current market equilibrium. Therefore, promoting LCC entry can be a feasible and useful first-step toward full liberalisation.

The profiles of NEA LCCs are summarized in Table 10. As of June 2014, most LCCs had less than 20 aircrafts in service and consequently small market shares. In addition, as reported in Table 11, NEA LCCs have mostly focused on the domestic markets. Although some LCCs serve a good number of international destinations (e.g. Spring Airlines in China, Air Busan, Jin Air in Korea), the low total frequencies reveal that they offer rather limited services to most overseas destinations. This would not help LCCs to reduce costs by exploiting economies of traffic density. In addition to constraints in bilateral service agreements, regulations are imposed by individual government. For example, although Seoul Gimpo airport has excess capacity and is located closer to the city than Incheon, foreign LCC services are only allowed at Incheon airport. The traffic right allocation by the Korean Ministry of Land, Infrastructure and Transport (MOLIT) is *ad hoc* without clearly defined rules, making it difficult for LCCs to optimize and plan their service offerings.

Table 10. NEA Low Cost Carrier Profile

Country	Airlines (code)	Fleet size	Service Starting Date	Key share-holder and /or parent airline	Main Hub
China	Spring Airline (9C)	41	18-Jul-05	Shanghai Spring International Travel Service	Shanghai Hongqiao Airport
	Lucky Air (8L)	26	Jul-04	Hainan Airlines Group (HNA)	Kunming Airport
	West Air (PN)	14	14-Jul-10	Hainan Airlines Group (HNA)	Chongqing Airport
	Juneyao Airlines (HO)	34	Jun-05	Juneyao Group	Shanghai Hongqiao Airport
Japan	Air Do	13	Oct-12	ANA, DBJ (Development Bank of Japan)	Tokyo Haneda Airport
	Jetstar Japan (GK)	18	3-Jul-12	Qantas, Japan Airlines	Tokyo Narita Airport
	Peach (MM)	13	Mar-12	ANA, First Eastern Investment Group and INCJ	Osaka Kansai Airport
	Skymark Airlines (BC)	32	19-Sep-98	Shinichi Nishikubo	Tokyo Haneda Airport
	Solaseed Air (6J)	13	Jul-11	Miyakoh Holding	Tokyo Haneda Airport
	StarFlyer (7G)	10	16-Mar-06	Star Flyer Inc.	Tokyo Haneda Airport
Vanilla Air (JW)	6	20-Dec-13	ANA	Tokyo Narita Airport	
Korea	Air Busan (BX)	12	Oct-08	Asiana Airlines	Busan Gimhae Airport
	Eastar Jet (ZE)	8	7-Jan-09	Privately owned, not listed	Jeju Airport
	Jeju Air (7C)	15	2-Jun-06	Aekyung Group	Jeju Airport
	Jin Air (LJ)	11	Jul-08	Korean Air	Jeju Airport
	t'way (TW)	7	Sep-10	KDIC, YeaRimDang Publishing	Seoul Gimpo Airport

Source: Company's official website and annual reports.

Note: Fleet statistics as of June 2014. Service starting date refers to the date when the airline began to offer services under the current name.

Table 11. NEA LCC Service Overview as of July 2014

Airline	Country	Number of domestic destinations	Domestic Weekly frequency	Number of international destination	International Weekly frequency
Lucky Air	China	44	1112	2	2
Ruili Airlines	China	7	98	-	-
Spring Airlines	China	38	1162	24	184
West Air	China	35	576	-	-
HK Express	Hong Kong	-	-	17	164
Air Do	Japan	14	517	-	-
AirAsia Japan Co Ltd	Japan	3	126	4	56
Jetstar Japan	Japan	10	586	-	-
Peach	Japan	10	346	9	140
Skymark Airlines	Japan	14	1144	-	-
StarFlyer	Japan	5	420	-	-
Vanilla Air	Japan	3	126	4	56
Air Busan	Korea	3	432	20	162
Eastar Jet	Korea	-	-	15	90
Jeju Air	Korea	5	400	19	240
Jin Air	Korea	2	170	36	152
t'way	Korea	3	250	10	56

Source: Compiled with OAG airline schedule data for the first week of July 2014.

There are signs that China is progressively allowing foreign LCCs into both major and medium sized airports. As reported in Table 12, foreign LCCs served 36 Chinese airports as of July 2014. Guangzhou, Hangzhou, Shenzhen and Shanghai Pudong airport had the highest weekly LCC flights. Qingdao has 20 LCC flights a week, mainly due to the provincial open-skies agreement signed between Korea and the Shandong province, which allowed Korean carriers to offer 14 weekly flights to the city. Otherwise Korean LCCs have quite limited services to China despite direct flights to 22 airports. For example, eight airports were served with one LCC flight per week only as of July 2014. A closer look on the data revealed that these services were all recently initiated by Jin Air, an LCC owned by Korean Air. Therefore, more flights may be added in the near future, and the LCC could have been assisted by its affiliated network carrier (i.e. Korean Air) in entering these routes. No Japanese LCC services were present at Chinese airports, although Chinese LCCs served 4 medium sized Japanese airports (i.e. Hiroshima, Ibaraki, Saga, Takamatsu) with a total of 18 weekly flights as of July 2014.

Table 12. LCC Entry to NEA Countries
(As of the 1st Week of July 2014)

Foreign LCC Entry to China (1st Week of July, 2014)						
Chinese airports	Number of Foreign LCCs	Number of Japanese LCCs	Number of Korean LCCs	Frequency of Foreign LCCs	Frequency of Japanese LCCs	Frequency of Korean LCCs
Guangzhou	4	0	0	54	0	0
Hangzhou	5	0	1	42	0	2
Shenzhen	3	0	0	33	0	0
Shanghai Pudong	4	0	1	31	0	7
Qingdao	4	0	2	20	0	14
Xi'an	5	0	2	20	0	6
Wuhan	2	0	1	15	0	1
Chongqing	1	0	0	14	0	0
Kunming	2	0	0	14	0	0
Beijing	3	0	0	12	0	0
Nanjing	2	0	0	11	0	0
Chengdu	2	0	1	9	0	2
Jinan	2	0	2	9	0	9
Haikou	2	0	0	8	0	0
Ningbo	2	0	0	8	0	0
Changsha	1	0	0	7	0	0
Nanning	1	0	0	7	0	0
Shenyang	2	0	1	5	0	3
Tianjin	2	0	1	5	0	2
Guilin	1	0	0	4	0	0
Shantou	1	0	0	4	0	0
Xiamen	2	0	1	4	0	2
Yantai	1	0	1	4	0	4
Quanzhou	1	0	0	3	0	0
Changchun	1	0	1	2	0	2
Hohhot	1	0	1	2	0	2
Lijiang	1	0	0	2	0	0
Taiyuan	1	0	1	2	0	2
Yinchuan	1	0	1	2	0	2
Dalian	1	0	1	1	0	1
Harbin	1	0	1	1	0	1
Hefei	1	0	1	1	0	1
Nanchang	1	0	1	1	0	1
Shijiazhuang	1	0	1	1	0	1
Yanji	1	0	1	1	0	1
Zhengzhou	1	0	1	1	0	1

Foreign LCC Entry to Japan (1st Week of July, 2014)						
Japanese Airports	Number of Foreign LCCs	Number of Chinese LCCs	Number of Korean LCCs	Frequency of Foreign LCCs	Frequency of Chinese LCCs	Frequency of Korean LCCs
Osaka Kansai International	8	0	3	78	0	35
Tokyo Narita Intl	6	0	3	58	0	28
Fukuoka	5	0	3	42	0	28
Nagoya Chubu Centrair	3	0	1	22	0	14
Tokyo Intl (Haneda)	2	0	0	14	0	0
Sapporo New Chitose Apt	2	0	2	11	0	11
Okinawa Naha Apt	1	0	1	7	0	7
Hiroshima	1	1	0	6	6	0
Ibaraki	1	1	0	6	6	0
Saga	2	1	1	6	3	3
Nagasaki	1	0	1	3	0	3
Takamatsu	1	1	0	3	3	0
Foreign LCC Entry to Korea (1st Week of July, 2014)						
Korean Airports	Number of Foreign LCCs	Number of Chinese LCCs	Number of Japanese LCCs	Frequency of Foreign LCCs	Frequency of Chinese LCCs	Frequency of Japanese LCCs
Busan	4	0	1	21	0	7
Jeju International	1	1	0	7	7	0
Seoul Incheon	8	0	2	126	0	35

Source: Compiled with OAG airline schedule data for the first week of July 2014.

Note: Summary statistics for China do not include LCCs in Hong Kong and Taiwan due to the special arrangements between these two regions with mainland China.

Overall, there are signs that China is progressively opening up its skies to foreign LCCs. Quite a few airports are now accessible, although services are still concentrated to a few airports several factors could have contributed to such a progress. As discussed previously, LCCs usually do not provide connection services, thus that they will not bring major competitive advantage to their parent airlines (if any). Major Chinese network carriers will be less concerned about increased competition. Meanwhile, the lower average costs and smaller aircraft used by LCCs imply that they are better positioned to serve medium sized airports in China, which are not congested and of secondary importance to Chinese network carriers. Provincial / municipal governments will also welcome foreign LCC services as they can benefit local airport, business and welfare. Therefore, foreign LCCs should be able to grow their services in non-hub Chinese airports significantly in the coming years.

Thanks to the open-skies agreement between Korea and Japan, these two countries' LCCs now have reasonably good network coverage in each other's territory. For example, Japanese LCCs have 5 daily flights (35 weekly flights) to Incheon and one daily flight to Busan. Korean LCCs not only have frequent services to major airports such as Kansai, Narita, Fukuoka and Nagoya, but also to five other regional airports. Compared to China, international and domestic LCC services are better developed in Japan and Korea, although LCC penetration rates in these two countries are still lower than in other Asian markets such as Malaysia, Singapore and Australia. Some constraints are still present and should be removed.

For example, the Seoul Gimpo airport is close to the city centre and has convenient ground transport systems. In 2001, all international services were relocated to Incheon airport, causing a 40% reduction in passenger volume almost over-night. Other than a few routes such as Seoul – Jeju Island, domestic aviation markets have achieved little growth over the years due to competition from high-speed rail services. To revive its business, Gimpo has been reducing operation costs and trying to improve its non-aeronautical services. Some regional flights to Japan, China and Taiwan have also been re-introduced together with Customs, Immigration and Quarantine (CIQ) services. Therefore, this airport is ideal for all types of international services. However, currently the Korean government allocated no traffic rights to foreign LCCs at Gimpo even though there is no congestion nor slot constraint. The Ministry’s mis-guided policy to promote Seoul-Incheon airport as the only hub airport is preventing Seoul-Gimpo airport from fully realizing its market potential. It is our view that this type of government regulations and intervention should be removed, thus that airlines can optimize their operations in a deregulated environment.

5. Summary, Conclusion, and further Thought

The benefits of air transport liberalisation have been confirmed by many studies. However, much of the NEA markets remain regulated despite strong growth in economy and international trade in the region, and the trans-border open-skies agreements that have been reached. Therefore, there is a need to investigate why governments in this region have not been able to achieve more, and whether a clear roadmap can be designed thus that liberalisation can be pushed forward on a fast track in the years to come. Although governments should aim to improve the overall social welfare of their nations and their economy as a whole rather than helping the vested interest, i.e., the aviation industry only, in practice dominant airlines in the region have been exerting significant political and practical influence against liberalisation. Therefore, investigations on major airlines' performances, in both overall and domestic market, will help predict their performances in the international markets, and thus their strategies in developing international routes and attitudes toward alternative liberalisation policies. In addition, an examination of legacy regulations in the domestic markets also sheds light on the policy priorities and philosophies of the regulators in international markets. The intuition is clear: if certain regulations have been persistent in the domestic markets, they are unlikely to be removed for foreign carriers in the near future.

Our investigation on the NEA aviation markets, in particular that of China, reveals that substantial legacy regulations are still present in the Chinese aviation market despite rapid growth in the past decades. In particular, our investigations lead us to the following conclusions:

- In the Chinese aviation market, dominant carriers are majority-owned and managed by either central or local governments. Many inputs and supporting services are also controlled by state-owned companies that have significant market power. The central government owns the largest three airline groups and dominant/monopoly companies that provide fuelling services, ticketing and airport IT services, fleet purchasing and leasing services. The regulator has little concern over market consolidation and competition. Only a few private airlines have been allowed to enter the market, and they are still much smaller than their state-owned peers.
- The regulations on route entry and airport slot allocation in China jointly provide dominant hub carriers preferential treatments, making it difficult for other airlines to compete in major hubs which account for a significant share of the Chinese markets. Although there is evidence that dominant airlines have improved their hub-and-spoke networks, there are also signs that precious airport slots have not been allocated in an efficient manner.

In summary, the Chinese government has tried to help major airlines to grow in size, instead of forcing them to improve and innovate via increased competition thus that these dominant players can achieve global competitiveness. Chinese airlines have not bridged the efficiency gap between global leaders, and the Chinese hub airports could have better aviation services and network connectivity if more liberalisation policies had been introduced.

Compared to services to North American destinations, Chinese airlines are currently more competitive in providing services to Europe, Asia and Oceania destinations. Therefore, Chinese airlines will be more open to liberalisation agreements with these countries, thus that they can develop their hubs into Asia's gateways to Europe. In general, however, there is no sign that these dominant airlines will welcome full liberalisation. As an intermediate compromise (instead of an optimal policy in the long term), promoting LCC services in the NEA region is a sensible policy. LCCs usually provide no-frill point-to-point services in short/medium distance markets. Liberalizing LCC services will not significantly influence competition among network carriers in inter-continental routes. In addition, whereas route entry and slot allocation at hub airports are closely monitored, regulators and major carriers are usually not that concerned with LCCs' expansion at regional airports. Local governments also welcome new services which improve their airports' connectivity and contribute to the regional economy. Therefore, promoting LCC entry can be a feasible and useful first-step towards full liberalisation.

In the long run, however, there is a need to fully liberalize the aviation markets in the region. After all, the top priority of the governments is to maximize welfare of the whole nation instead of protecting airlines only. In addition, studies in the airline sector, together with lessons learnt in other industries have shown that a "national-champion" strategy rarely works. It is increased competition that forces airlines to improve and innovate, thus that they can achieve global competitiveness and sustain long term growth.

As discussed in this paper, the Korean and Japanese governments overall, and, to some extent their transport ministry officials, now realize that opening up the air transport market in Northeast Asian region is an important economic issue. However, the current dominant players in China's air transport sector, somewhat helped by CAAC's regulations, have restricted domestic competition and foreign carrier entries. This holds especially services to major airports in metropolitan areas in Beijing, Shanghai and Guangzhou. This policy is likely to continue until one or more of the following situations will occur:

- China's three major carriers are now among the largest carriers in Asia, and are on their way to becoming the largest carriers in the world within this decade. Policies aimed at protecting the major carriers at this stage are akin to 'treating Giants as Babies', which doesn't make much sense. Unless CAAC's senior officers and bureaucrats realize this in time, China's economic leaders, elites and perhaps state leaders will eventually realize that 'treating Giants as Babies' is a wrong air transport policy which harms China's economy and ordinary citizens ;
- In the years to come Korea and/or Japan may put the air transport issue on China-Korea, China-Japan and/or tripartite Economic Summit meetings agenda so that proper trade-off among trade, investment and air transport opportunities can be made. Instead of postponing industry reform and restructuring as long as possible, it is better for the transport ministry and CAAC officials to proactively design deregulation / liberalisation policies with a clear road map. With informed policy changes down the road, the Chinese aviation sector can innovate and improve to achieve international competitiveness ;
- Over time, other central government agencies together with local governments and airports will see the opportunities that foreign carrier entries can help them achieve important politico-economic objectives. Private airlines will request more freedom to operate and compete with state-owned carriers on an equal basis. There will be increased pressure for deregulation and liberalisation;

Aside from these possible events that may trigger liberalisation policies, CAAC and major carriers in China may want to open up markets to their Asian neighbours even for their own benefits. Our reasoning on this goes as follows:

- As examined already, China's major airlines and airports are well positioned to route Euro-bound Asian traffic including connecting traffic originating in or destined to Korea and Japan via their major hubs in China (Beijing, Shanghai, Guangzhou, Chengdu etc.);
- With higher frequencies of services that China's hub carriers can offer from their current and future super-hubs to intercontinental destinations (including North America and Europe) in the future, Chinese airlines can attract increasingly more overseas travellers originating in Japan and Korea to travel via Chinese hub airports. When China's air travel propensity increases to 0.75 per capita, its air transport market will exceed that of United States. By then China's super-hub airports are likely to assume similar roles in Asia as those of Chicago, Atlanta and Dallas in USA, offering high frequency of services to major intercontinental destinations in Europe and North America.

The benefits of air transport liberalisation have been confirmed by many studies on mature markets. More investigations focused on NEA aviation markets are needed thus that the governments and regulators in the region can make informed decisions and commit to a clear road-map for liberalisation. If regulators and major carriers in the region fully recognize such opportunities which may be realized within this decade, there may be a rational move by these power brokers to proactively push for liberalisation instead of trying to kick the can down the road as long as possible.

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