

## **An overview of China's recent domestic and international air transport policy**

### **Abstract**

This chapter reviews China's domestic and international air transport policy. The introduction of private and low-cost carriers, together with the emergence of HSR, put much competitive pressure on the Chinese state-owned carriers and create momentum for further reforms in China's air transport sector. In the last two decades, relatively liberal air services arrangements have been made with some major markets including the US, ASEAN, Korea, Japan etc. These open and liberal arrangements have given the Chinese carriers the room to grow and the chance to become stronger. They in turn call for further liberalisation moves to allow for their deeper participation in and engagement with international air transport service provisions.

#### 1. Overview of China's economic growth and air transport industry

Air travel and economic growth have an intertwined relationship. On the one hand, the demand for air travel depends heavily on economic conditions, resulting in the fact that the air transport industry is extremely cyclical in demand. On the other hand, it is a widely held view that as an input into many economic activities including tourism, trade and investment, air transport has been an important component in achieving economic development and welfare enhancement (Zhang and Findlay 2014). Air transport is particularly important to distant and remote regions where there is no close substitute for this transport mode due to the tyranny of distance. In some parts of the world, air transport is the only viable means of transportation for both goods and people due to geographic or climate constraints (Pagliari 2010). This co-relationship is best reflected by leisure travel, which heavily relies on the increase in disposable income, while at the same time, air transport can substantially contribute to a country's tourism by bringing in tourists and revenues, thereby increasing local residents' disposable income.

China has been the second largest aviation market in the world in terms of the volumes of passengers and air cargo moved in its domestic market since 2007. In 2018 the whole industry handled 611.7 million passengers and 7.4 million tonnes of air cargo, representing 10.9% and 4.6% increases from the previous year, respectively. China's airline market is a growing market underpinned by a huge population and rapid economic growth. IATA

forecasts that China will overtake the United States (US) as the largest air passenger market in the mid-2020s measured by traffic to, from and within a country. It is believed that the growth in China and other Asian economies including India, Indonesia and Thailand will shift the centre of gravity of the air transport industry from the west hemisphere to Asia in the next two decades.

Figures 1 and 2 depict the passengers and cargo carried by China’s air transport sector from 2009 to 2018. The growth rates for both passenger and cargo markets were remarkable immediately after the economy recovered from the hit of the global financial crisis. In recent years, the growth rates for both markets were quite stable. The passenger market performed particularly well, recording a two-digit growth, even though the GDP growth rate was only around 7% in the last few years.

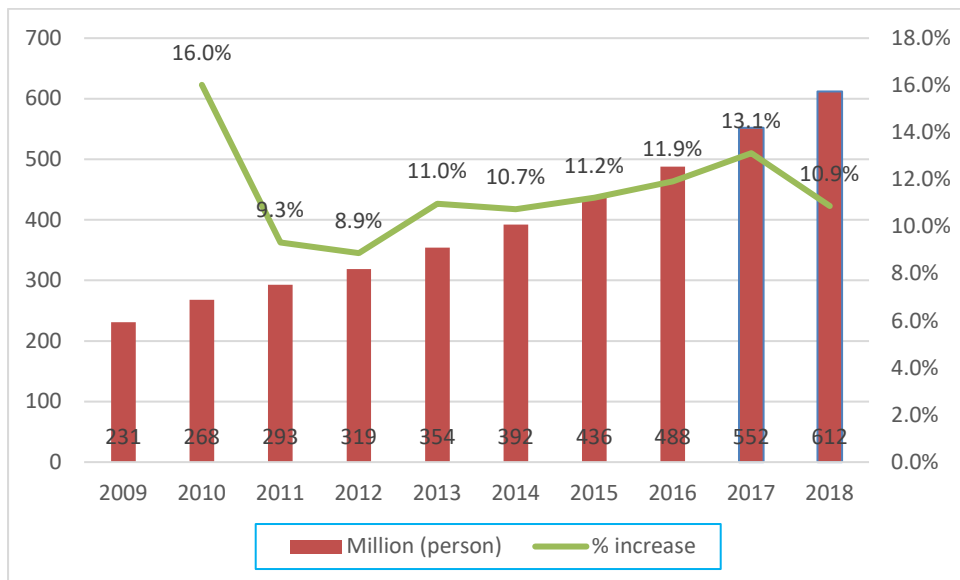


Figure 1 Number of passengers handled by China’s airline industry 2009-2018

Source: CAAC

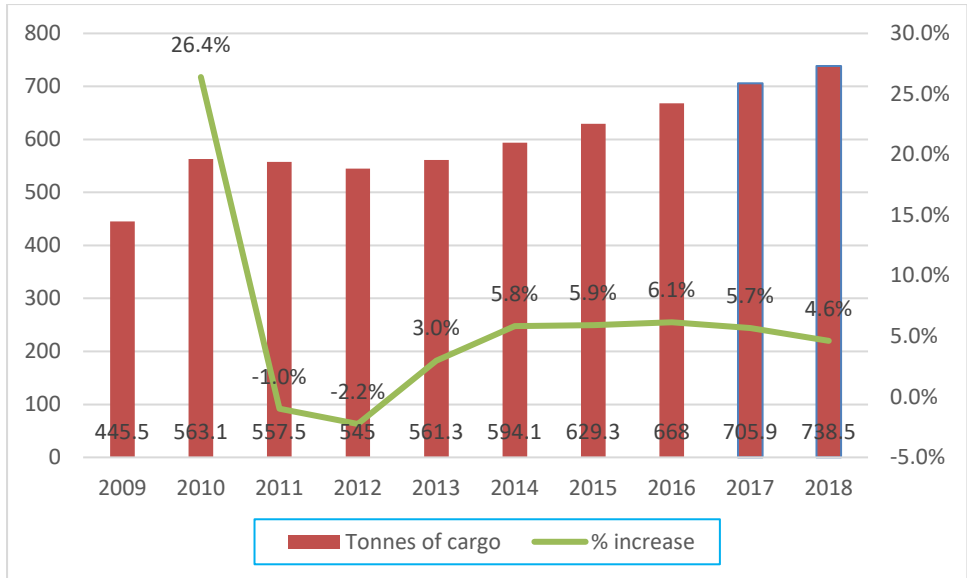


Figure 2 Tonnes of cargo handled by China's airline industry 2009-2018

Source: CAAC

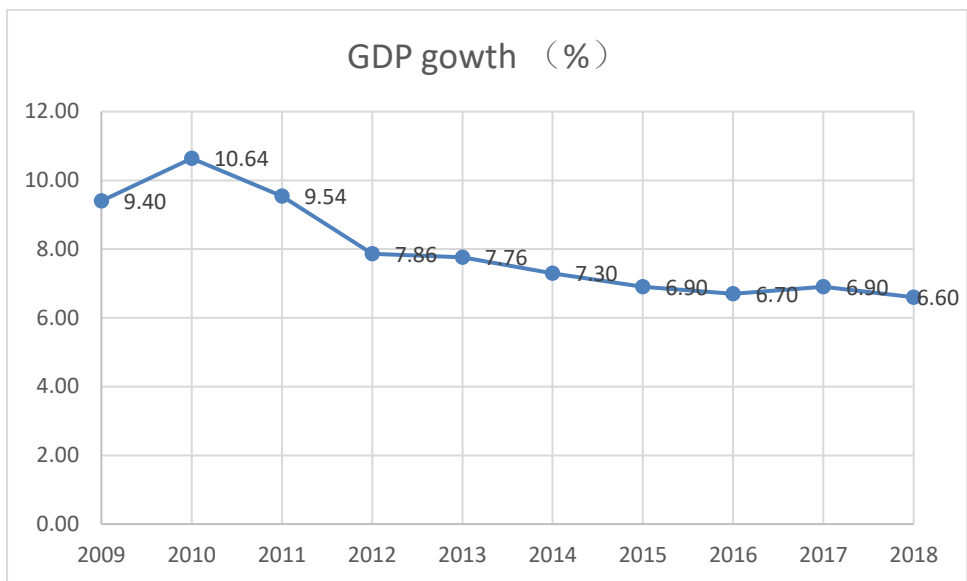


Figure 3 China's GDP growth 2009-2018

## 2. The development of China's domestic air transport policy in the new century

### 2.1 Deregulation and privatisation

Zhang and Zhang (2016) note that unlike the USA and EU, where the Deregulation Act and three legislative liberalisation packages, respectively, paved the way for airline deregulation, there was no formal legislation in China to guide the deregulation process. Most of the deregulation measures were issued by CAAC in the form of ‘rules’ and ‘guidelines’, which could be reversible when some unintended consequences arose. This is evidenced by the fact that although there was an informal relaxation of the Chinese government’s control of airfares in 1997, in the following years CAAC attempted many times to re-regulate the fares after they saw continuous price wars in the domestic markets. The final resort to avoid strong competition among state-owned carriers was to guide them into consolidations in October 2002 and created China’s big three: the Air China Group, the China Eastern Group and the China Southern Group. These consolidations mergers faced no antitrust challenge at that time due to the absence of any effective antitrust laws. Other significant and influential mergers supported by the government include the China Eastern-Shanghai Airlines merger in 2009 and the takeover of Shenzhen Airlines by Air China in 2010.

However, it appeared that the 2002 airline consolidations did not effectively lesson competition or confer the three airline groups with any significant market power in both short and longer term as revealed in Zhang and Round (2009) and Zhang (2015), largely owing to the implementation of other forms of deregulation in the following years, including the relaxation of entry to and exit from markets, and the introduction of low cost carriers (LCCs), which put significant competitive pressure on China’s state-owned carriers (Zhang and Zhang, 2016, 2017). In particular, competition in the markets associated with Beijing, Guangzhou and Shanghai remained strong, and almost all new and existing airlines wish to launch services to these markets. As a result, airlines had a strong incentive to lobby CAAC to impose restrictions on market access to some of these markets, especially the routes linking Beijing, Shanghai and Guangzhou, which are still heavily regulated today. In contrast, for other airline routes, prior approval for entry and exit is no longer required (Zhang and Round, 2008).

Apart from supporting airline consolidations, CAAC promulgated ‘The Scheme of Domestic Airfare Reform’ and set a price ceiling and a price floor for the domestic airfares in 2014 to defer price wars. However, in practice, the price floor limit was largely disregarded and competition in prices remained strong as the state-owned airlines except a few routes such as Beijing-Shanghai and Shanghai-Guangzhou where tacit collusion was quite successful

(Zhang and Round, 2011, Ma et al., 2019). The restrictions on airline pricing were formally abolished in 2013. Although they were not effectively enforced for many years, the formal removal of these pricing regulation reflects CAAC’s positive attitude towards the market mechanism and the idea of air transport liberalisation.

The release of the ‘Regulation on Domestic Investment on Civil Aviation’ in 2004 allowed private sector’s participation in the civil aviation industry and led to the establishment of China’s first batch of private airlines in 2005 including Okay Airways in Tianjin, United Eagle Airlines in Chengdu and Spring Airlines in Shanghai. Spring Airlines positioned itself as an LCC and was publicly listed in 2015. Today it is the largest private carrier and also the largest LCC in China. The number of private carriers quickly mushroomed and by 2007 and this number reached 20. This put a strong challenge to the state-owned carriers and raised security and safety concerns. CAAC then decided to suspend approval of new domestic entrants until 2010. Following the crash of an aircraft of a local airline in 2010 (Yichun aircraft crash’ as shown in Figure 4 below), the government extended the suspension policy until 2013. Subsequently, another wave of private airlines emerged in 2013 and 2014.

It is argued that 2014 is the banner year for the Chinese LCC industry because of the release of the ‘Guiding Opinions on Promoting Low Cost Aviation Industry Development’ by CAAC. For the first time, the aviation authorities acknowledged the significant role played by LCCs in the nation’s economy. From 2013 to 2014, there was another wave of private airlines established in China. Some of the existing carriers rebranded themselves as LCCs during this period including China United Airlines (see Table 1). At the end of 2018 there were 45 state-owned airlines and 15 private airlines. Among the 60 carriers, 9 of them were all cargo carriers and 8 were publicly listed. Ten carriers had foreign equities. The chequered deregulation in China’s private aviation is shown in Figure 4.

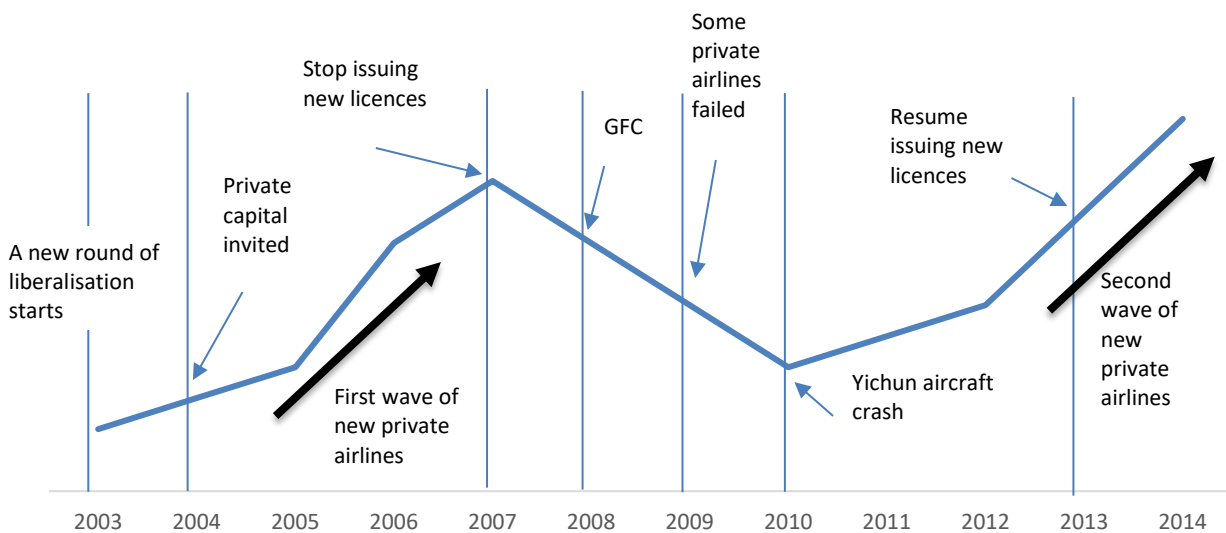
Table 1 Profile of LCCs in China as of December 2017

Airline name	Airline code	Year declaring as LCC	Fleet size	Base	Ownership
Spring Airlines	9C	2005	81 ( A320, B737)	Shanghai Hongqiao and Pudong, Shijiazhuang, Shenyang, Shenzhen	Private

West Air	PN	2013	30 (A319, A320)	Chongqing, Zhengzhou	Private
China United Airlines	KN	2014	31 (B737, B738)	Beijing	State-owned
Jiuyuan Airlines	AQ	2014	14 (B738)	Guangzhou	Private
Lucky Air	8L	2016	45 (B737, B73G)	Kunming, Lijiang, Chengdu	Private

Source: websites of relevant airlines

Figure 4: The chequered development journey of China’s private airlines, 2003–14.



Source: The chart was modified based on Xia (2014). (GFC for ‘global financial crisis’.)

Some of the private airlines established in the first wave around 2005 quickly failed due to the lack of experienced pilots and skilled personnel, and the high costs and taxes associated with aircraft procurement, jet fuel and airport charges (Zhang and Lu, 2013). However, the most serious obstacles that stifled the growth of China’s private and LCCs are the hostile aviation policy. In most cases, the state-owned airlines could exercise a significant influence on the

CAAC's decision. Any aviation reforms and new aviation policy would put the interests of the state-owned airlines first (Zhang and Zhang, 2016, 2017). For example, for a long time, airport slot allocation in China has been a closed-door deal that favoured the state-owned airlines. When the Shanghai-based Spring and Juneyao were granted the right to fly between Shanghai and Beijing, they were only given a departure time from Shanghai at late night and from Beijing at early morning, almost the last two flights from Shanghai to Beijing and earliest ones from Beijing to Shanghai. The big three operated about 50 flights every day while these two private carriers only operated one flight each. Being unable to attract many passengers, Spring suspended its service on this route for some time and did not return until recently.

Yu et al. (2019) compared the operating efficiency performance between Chinese and India carriers. They found that China's three state-owned airlines performed poorly in both the capacity generation and service stages, particularly the latter. In contrast, the private LCC, Spring was one of the most efficient carriers during the period between 2005 and 2015. They confirm that the LCC model and private ownership are significantly associated with better airline efficiency performance. Interestingly, the state-owned Air India is much more efficient than its Chinese counterparts, probably indicating that state-owned airlines operating in an environment dominated by private and LCCs tend to become stronger in efficiency. Therefore, there is a need to formulate supportive policies towards LCCs and private carriers in China. In 2018, China further eased investment access to aviation industry, allowing private capital to account for more than 50% of their equity as long as the government remains to be the largest single shareholder. This move will likely improve the efficiency of the state-owned carriers.

## 2.2 Evolution of China's airport connectivity

The concept of connectivity in air transport was first introduced to evaluate the importance of an airport in terms of its connection to other airports (Zhu, et al., 2018). Zhang et al. (2017), Zhu et al. (2018a), and Zhu et al. (2019b) have developed a connectivity measure to quantify an airport or a city's connections with other cities or countries. This measure not only considers the quantity indicators such as the number of seats, but also the travel quality indicators such as travel time, aircraft type, etc. This kind of measure can be used to evaluate the role of an airport in the existing air transport network, helping detect weak points and seek ways to improve the reliability and accessibility of the network to reduce travel time and costs (Hadas et al., 2017). Table 2 list the air connectivity scores for the top 20 airports in China in selected years from 2006 to 2016. Note that like consumer price index, these connectivity scores are

unitless and only meaningful when they are used to compare the level of connectivity across airports or over time. It can be seen that Chinese airports achieved tremendous success in increasing their connectivity from 2006 to 2016. The increase is particularly impressively in secondary tier cities (Beijing, Shanghai, and Guangzhou are normally regarded as the first tier cities and most provincial capital cities are the second tier).

Table 2 Airport connectivity 2006-2016

Airports	Y2006	Y2008	Y2010	Y2012	Y2014	Y2016
Beijing Capital	5943	6608	7243	7909	8489	8762
Guangzhou	3395	4032	4607	5219	5746	6095
Shanghai Pudong	3236	3529	3849	4292	4721	5693
Kunming	1845	2194	2730	2957	4001	4805
Shenzhen	2335	2669	3192	3497	4296	4729
Chengdu	2247	2333	2945	3406	3868	4585
Xi'an	1257	1392	2240	2977	3609	4116
Shanghai Hongqiao	2281	2670	3232	3619	3907	3980
Chongqing	1119	1522	2034	2746	3339	3800
Hangzhou	1302	1683	2045	2362	2960	3565
Urumqi	769	845	1499	2079	2508	3071
Xiamen	997	1279	1734	2260	2789	2965
Harbin	583	890	1130	1380	1909	2508
Nanjing	742	1185	1554	1769	1900	2484
Zhengzhou	576	797	1170	1392	2043	2392
Qingdao	918	1084	1440	1685	2032	2370
Changsha	851	1150	1583	1818	2063	2320
Shenyang	789	1030	1226	1436	1822	2225
Wuhan	724	1081	1368	1578	1930	2200
Dalian	767	980	1383	1508	1847	2157

Source: Zhang et al. (2017).

Table 3 reports the major Chinese carriers' link connectivity at the domestic market level, which is the aggregation of their route-level connectivity. From 2007 to 2017, the connectivity of the big four carriers more than doubled in the domestic market, suggesting that China is a



growth market. The performance of Spring Airlines, an LCC, experienced a 23-fold increase in the domestic market, which is remarkable. However, compared with the big three, Spring is still small in scale given its connectivity was only 13% of China Southern’ in 2017.

Table 3 Airline connectivity in China’s domestic market 2007-2017

	China Southern	China Eastern	Air China	Hainan Airlines	Spring Airlines
2007	121576	83425	71628	39800	1113
2009	140861	105151	86904	45442	7296
2011	152786	118108	96091	46769	13349
2013	174343	140976	106542	60453	18460
2015	193412	160837	115796	64430	20276
2017	200750	179384	126263	80379	25963

Source: The calculation was based on IATA AirportIS’ historical schedule data.

### 2.3 The impact of high-speed rail (HSR)

In the last decade, high speed rail (HSR) has emerged as a significant transport mode in China, posing a serious threat the China’s air transport sector (Zhu et al., 2019b). In 2018 the length of China’s HSR track amounted to 27 684 km, representing the largest HSR network (64% of the total) in the world. According to the updated ‘Medium-to-Long-Term Railway Network Plan’ report covering the period 2016–25 with an outlook to 2030, China’s HSR network will by 2025 stretch to 38 000 km, including eight north–south and eight east–west trunk lines (Fu et al., 2015). By 2030 China’s HSR network will reach 45 000 km in length, and most cities with a population of 500,000 or more will be connected by HSR. In fact, under China's recent expansion plan, by 2025 about 80% of its domestic airline routes are to be overlapped with HSR lines (Zhang et al., 2019).

The spread of HSR network has forced Chinese airlines to cut domestic airfares and reduce or cancel flights (Zhang et al., 2019). Zhang and Zhang (2016) show that the presence of HSR services would significantly reduce the bilateral air passenger flows by 53%. In fact, in extreme cases air services could be suspended as a result of the launch of HSR service: 48 days after the opening of the HSR between Zhengzhou and Xi’an, all the flights between the two cities were cancelled; in the same year and for the same reason, airlines withdrew from the Wuhan–Nanjing and Wuhan–Nanchang routes; Wuhan Tianhe Airport recorded its first

negative growth (-8.52%) in air passenger throughput during the Chinese New Year holiday in 2011 due to the impact of the opening of Guangzhou–Wuhan HSR. Quite consistent results are reported in Chen (2017) who investigated the air-HSR competition on the Wuhan-Guangzhou and Beijing-Shanghai routes and found a significant drop in air traffic, flight frequency and seat capacity as a result of the introduction of parallel HSR services. Specifically, the author reports a drop in domestic passengers by 28.2%, in flight number by 24.6% and in seat capacity by 27.9% after the introduction of HSR services. The negative impacts on air service are the greatest on the routes with a distance between 500 and 800 km. When the Guangzhou-Wuhan HSR opened in 2009, there was a decline of air services between the two cities by 45% and the fall was 33.6% when the Beijing-Shanghai HSR was launched. Li et al. (2019) again confirmed the strong negative impact of HSR frequency on air travel demand. Such negative impact of HSR is stronger in China's central and western regions.

As a strong competitor to airlines, HSR is expected to put a downward pressure on airfares. Interestingly, however, mixed results have been produced regarding the impact of HSR on airfares. Ma et al. (2018) found that before 2014, HSR did place a negative pressure on airfare in China's airline market. However, from 2014, the negative impact gradually disappeared. The authors explained that two reasons are behind the changes. First, airlines were unlikely to charge higher prices immediately after the launch of HSR services, but they could develop strategies over time to respond to the HSR entry. Reducing frequency and capacity is one example. Seeking price-fixing is another possibility. Ma et al. (2019) show the entry of the HSR led to airfare convergence on the Beijing-Shanghai airline route, which might indicate the existence of tacit collusion among the operating carriers. Second, HSR could complement the air services and bring in more passengers from nearby cities at both endpoints of the route. The Director of the CAAC announced in 2017 that some flights from second- and third-tier cities to Beijing would be shifted to Tianjin and Shijiazhuang with these airports being linked to Beijing via HSR (Zhang et al., 2017). Ma et al. (2019) pointed out that while HSR poses a threat to air transport, it can also be used to mitigate congestion problems at mega-airports and help make full use secondary airports' capacities through air-rail cooperation agreement. It is expected that the deepening of such cooperation would help stabilise airfares.

In the face of a strong and irreversible competitor, HSR, that offer similar products, China's air transport sector needs to work out new strategies and develop new policies to sustain the growth of this industry. Obviously, encouraging price-fixing activities is no

longer a choice as it is illegal to do so under the 2008 Anti-Monopoly Law, although explicit price collusion was a common practice in China's aviation market. For example, after the control over airfares was relaxed in 1997, CAAC constantly sought to re-regulate airfares to avoid price wars and industry losses by putting a limit on the maximum discounts (Zhang and Zhang, 2017), including introducing 'revenue pooling' program and supporting airline consolidations to restrict competition from the late 1990s to the early 2000s (Zhang and Round, 2008). With the introduction of the anti-trust law and the HSR services, Chinese airlines have a stronger incentive to lobby CAAC not to open heavily travelled and lucrative markets to new carriers. This has been the case as mentioned earlier, and can be justified at this stage given the fact that the airports of Beijing and Shanghai are over-congested. However, with the opening of the new Beijing Xiaxing Airport and the introduction of the third terminal in Shanghai, congestion is of a less concern, there is no legitimate reason not to treat the state-owned and private carriers equally. As such any market access restrictions may not be able to stay long.

Zhang and Zhang (2016) pointed out that the the challenges facing China's air transport sector will be greater in the near future after the rapidly expanding HSR network has connected most of the major cities. Therefore, Chinese airlines need to consider redeploying part of their capacities to international markets. This is actually the case for Spring Airlines that has shifted a significant part of its capacity on to the East Asia and Southeast Asia markets in the last few years. This implies that the Chinese government needs to consider embracing more liberal air services agreements/arraigments (ASA) including actively pursuing 'open skies' deals. This will be discussed in the next section.

### 3. Liberalising international air transport

#### 3.1 Liberalisation process before 2003

The 1944 Convention on International Civil Aviation, also known as the Chicago Convention, established the ICAO as the governing body for the aviation industry worldwide. A regulatory framework including three elements was formed to deal with the economic issues involving international air services: bilateral air services agreements (ASAs) for the control of market access; inter-airline commercial or pooling agreements; and the International Air Transport Association (IATA) for controlling tariffs (Doganis, 2001). A typical air service agreement specifies the rights to fly across borders and such rights are

restricted to airlines designated by the signatories. These airlines need to be owned and controlled by residents of the country making the designation. As a result, airlines from third parties are discriminated against: they either cannot fly on the routes between the countries involved in the bilateral agreement or they have only restricted access. Some bilateral agreements also restrict the capacity and frequency of the services which the designated airlines provide (Zhang and Findlay, 2011).

Liberalising international air transport market has been a long, gradual and on-going process for China. Before 1987, CAAC was the aviation regulator as well as the commercial flight operator. To encourage operating efficiency and profitability, in 1987 the State Council ratified the 'Report on Civil Aviation Reform Measures and Implementation', and separated CAAC's government, administrative and regulatory role from the day-to-day operations of commercial airlines and airports (Zhang and Round, 2008). As a result, between 1987 and 1991 six state-owned trunk airlines based in the regional capital cities were established: Air China (Beijing), China Eastern (Shanghai), China Northwest(Xi'an), China Northern(Shenyang), China Southwest(Chengdu) and China Southern(Guangzhou). During this period, many local governments worked with CAAC and established their own carriers including Hainan Airlines, Xiamen Airlines, Sichuan Airlines, etc.

For a long time until the new century, Air China was the only national flag carrier, and inherited almost all the international traffic rights from CAAC, particularly the rights to fly long-haul international routes to the US and Europe. It was not until 1992 when China Eastern was designated as a carrier flying international markets. Despite this, China Eastern's international services only focused on the East Asia markets and a small number of long haul international routes to the US and Europe. China Southern was allowed to provide services to Southeast Asia from Guangzhou. Other airlines almost had no rights to fly international markets. With such an arrangement, the big three had little direct competition in the international markets.

Although China's air transport sector achieved rapid growth after its initial deregulation in the 1980s, there was still a lack of clear, coherent and well articulated policy objectives in terms of international air transport before 2003, result in the country's airline industry being unable to develop a competitive edge compared to their counterparts in their neighbouring countries, let alone carriers in the US and Europe. China's international sector ranked 16<sup>th</sup> measured by revenue passenger kilometres (RPK) in 2000, far behind Korea, Singapore,

Australia and Canada. The bad safety record in the 1990s worsened the situation. Quite often, on the same international route, Chinese carriers' market share was one third of the foreign airlines' (Zhang and Chen, 2003). Therefore, until the early 2000s, China's international aviation policy was very conservative, mainly because CAAC wanted to protect the interests of its weak state-owned carriers, particularly when negotiating ASAs. Zhang and Chen (2003) reported that CAAC tended to impose strict restrictions on the number of designated airlines, routes, capacity and frequency in the ASAs. The allocation of the traffic rights was based on actual market shares between Chinese and foreign carriers, not on the capacity provisions.

### 3.2 The liberalisation process after 2003

The radical shift towards a more liberalised international air transport policy came after China's accession to the World Trade Organisation (WTO) in 2001. The Annex on Air Transport Service to the General Agreement on Trade in Services (GATS) under the WTO has noted trade rules and principles such as most-favoured-nation (MFN) treatment, national treatment and transparency to three specific so-called 'soft' rights: aircraft repair and maintenance, selling and marketing of air transport and Computer Reservation System (CRS) services. The traffic rights (or hard rights) are excluded from the WTO framework. However, the WTO has been constantly considering the possibility of the expansion of its coverage and reviewed the possibility of including air transport, thereby putting much pressure on China's aviation authorities to build a strong and profitable air transport sector to support economic development and international trade.

In October 2003, CAAC declared that it would liberalise its international air transport sector with a 'proactive, progressive, orderly and safeguarded' approach (Lei and O'Connell, 2011). The principle was written into the Annual Strategic Development Plan for 2004 that clearly stated that CAAC would support Chinese carriers to expand their international services. Lei et al. (2016) note that a fundamental change since 2003 was that the interests of the state-owned carriers would no longer be the sole consideration when the government negotiated traffic rights with foreign countries. In 2003, an unilateral open skies arrangement was made in Hainan Province, giving unlimited 3<sup>rd</sup>, 4<sup>th</sup> and 5<sup>th</sup> freedom traffic rights for both Chinese and foreign carriers. At the end of 2018, the number of international routes of Hainan (including routes to/from Hong Kong, Macau and Taiwan) increased to 61 from 5 in 2003. The effect of this unilateral Open Skies policy on the tourism industry has been tremendous.

In 2002 Hainan Province received less than 400 000 overseas tourists and this figure had increased to about 1 million in 2008. Now it is well above 1 million.

In 2004, China and the US reached a significant achievement in liberalising the bilateral ASA: the number of designation increased from four to nine for both sides; the designated carriers were allowed to access any cities of the other side; the number of flights each week between the two countries would increase to 249 in a phased-in matter (Lei et al., 2016). Further expansion of this deal was concluded in 2007 including increasing frequency and removing the limit on the number of designations. Lei et al. (2016) claim that the two deals in 2004 and 2007 between China and the US have profound impacts on the China-US market, one of which was the gradual improvement of Chinese carriers' operating and finance performance in the following years. In 2011, in the China-US market, Chinese carriers' share was 38%; in 2014, this figure increased to 50%; in 2017, Chinese carriers commanded a share of more than 60%. A decade ago, Chinese carriers were unable to fully utilise their allocated traffic rights and it was the US carriers that were keen to chase for more rights. It is the other way around today: the Chinese carriers pushed for more liberal arrangement between the two countries. Therefore, it can be argued that the 2004 and 2007 protocols have served as big milestones in terms of shaping China's international air transport policy.

Table 4 reports the number of flights of China's big three in the China-US market from 2006 to 2018. It can be see that Air China is the largest carrier in the market, but China Eastern has followed closely in recently years.

Table 4 The number of flights (yearly) of the big three, 2006-2018

	2006	2008	2010	2012	2014	2016	2018
Air China	1704	1944	1936	2432	4284	5280	6032
China Eastern	888	960	1200	1560	3052	4780	5072
China Southern	656	628	492	672	832	2672	2632

Source: IATA AirportIS

Following the success of the liberal arrangement between China and the US, an open skies agreement between China and ASEAN was inked in 2010, aiming to establish an unlimited air service arrangement (passengers and cargo) between China and ASEAN members. Since then, the number of flights between ASEAN and China has increased rapidly. Traditionally, air transport services between ASEAN and China were offered by the flag carriers, and between gateway cities. The open skies agreement allowed both flag and non-flag carriers to increase flight frequency and offer flights to many second- and third-tier cities (Law et al., 2018). As a result, air connectivity between ASEAN and China has increased substantially. The number of flights operated by China's big three between China and Thailand, and Singapore is shown in Table 5. It can be seen that all the three airlines experienced substantial increase in capacity in the China-Thailand market. Air China recorded a decrease in the number of flights between China and Singapore and the other two saw moderate increases. Usually Singapore is a business destination while Thailand is a tourist destination. It seems that tourist destinations benefit most from the China-ASEAN open skies.

Table 5 The number of flights operated by the big three between China and Thailand, Singapore 2007-2017

Airline	From China to	2007	2009	2011	2013	2015	2017
China Southern	Singapore	1176	904	1848	2156	1936	2632
	Thailand	2184	1504	2840	5980	12236	11680
Air China	Singapore	2568	2352	2672	2016	1968	1968
	Thailand	1244	940	884	1824	3776	5760
China Eastern	Singapore	2400	2184	3504	3688	3096	3560
	Thailand	2084	1812	4204	7128	10196	9512

China is Australia's largest trading partner in terms of both imports and exports, while Australia is China's sixth largest trading partner. China is Australia's second largest inbound tourist market after New Zealand, and the largest total expenditure market. Air transport between Australia and China has experienced a phenomenal growth in the last 10 years, with more direct flights launched between the two countries. In December 2016, an open skies arrangement was concluded between the two nations, which removed all capacity restrictions

between Australia and China for each country’s airlines. Zhu et al. (2019a) report that in 2005, only Beijing, Shanghai and Guangzhou had direct flights to Australia’s Sydney and Melbourne and most Chinese travellers used Hong Kong, Singapore and even Seoul as a transfer point to Australia. However, in 2016, seven Chinese airlines served the China-Australia market — from China’s 10 first-and second-cities to Australia’s major capital cities.

In 2016 China Southern was the largest contributor (38%) to the direct connectivity between China and Australia, followed by China Eastern’s 21.8% and Air China’s 18.6%. Qantas only made a contribution of 6.2% (Zhu et al., 2019a). Guangzhou has forged its status as a significant transfer hub between Australia and China thanks to China Southern’s contribution. China Southern started to increase its flight routes to Australia from Guangzhou from 2009. In 2012, China Southern signed a strategic cooperation agreement with Tourism Australia to build the ‘Canton Route’ — the route link Europe, and Australia via Guangzhou. It has since then launched non-stop services to all major Australian capital cities from China, including Adelaide, Brisbane and Perth. Apart from increasing frequency and destination to the Australia market, China Southern has worked with Guangzhou Immigration and Customs to simplify the transfer procedure and launched ‘through check-in’ service in 2012, which means that the transit passengers do not need to reclaim their baggage at Guangzhou Airport for customs clearance, no matter they travel out of or into China. In addition, China Southern provides transit passengers with free transit lounge services if the transit time exceeds four hours. In 2012, the number of transit passengers using the ‘through check-in’ service increased was 458, 000 while in 2016, this number increased to 1.74 million. Table 6 gives the annual flights between China and Australia by China’s big three.

Table 6 Annual flights between China and Australian in selected years 2007-2017

Airline	2007	2009	2011	2013	2015	2017
China Southern	620	652	2476	3236	3428	4800
Air China	696	1048	1400	1412	1576	2000
China Eastern	704	720	1192	1948	2084	3528



Oum and Lee (2002) discussed the possibility of creating open skies in Northeast Asia and identified many obstacles. The reluctance of the state-owned carriers was one. However, more than decade on, most of the obstacles have changed or disappeared. The benefits of the open skies and the single aviation market examples have been observed and accepted by many governments and consumers, which makes the conclusion of an open skies zone in Northeast Asia more possible than in the early 2000s. Liu and Oum (2018) note that the rapid growth of China's big three has conferred them with the opportunity to play a leadership role in the world air transport sector.

There have been regular meetings among the aviation authorities of the three Northeast Asian economies. Open skies arrangements have also been implemented between Chinese Shandong province and Korea since 2006. China and Japan reached an open skies deal in 2012 but this deal excludes flights to/from Beijing, Shanghai, Tokyo Haneda and Tokyo Narita. In 2019, China and Korea signed expanded bilateral air services MoU to add 14 weekly flights between Beijing and Seoul to support Beijing Daxing International Airport that is to be open in later 2019. Korea is keen to pursue an open skies deal in this region, given its relatively small domestic market and its close cultural and economic links with China and Japan. The signing of an Open Skies agreement between Japan and the Korea in 2007 has lifted restrictions on frequency, capacity and destinations, with the exception of the congested Tokyo airports, covering both cargo and passenger services. The number of flights to and from China operated by the major carriers in Northeast Asia is shown in Table 7.

As can be seen from the table, Air China and China Eastern recorded a decrease in the number of flights between China and Korea. Although one may argue that it is possible that these airlines may have used larger aircraft and thus reduced the frequency. A closer look reveals that the types of aircraft used have been quite consistent. Interestingly, Korea's two major airline had substantial increases in the number of flights in the China-Korea market. In the China-Japan market, China's big three reported a steady increase while Japan Airlines showed a decreasing trend in the number of flights. Therefore, for any liberal arrangements, there will always be winners and losers. However, Table 7 shows that all the major airlines put a significant amount of capacity in the Northeast Asia market compared to other markets. Such a significant market implies that the benefit of open skies or a single aviation market is likely significant.

Table 7. The number of flights to and from China

Airline	Between China and	2007	2009	2011	2013	2015	2017
Air China	Japan	11248	11324	11544	11596	14104	14952
	Korea	8080	6240	6784	7000	8784	6472
China Eastern	Japan	11872	12888	13756	13604	20440	23112
	Korea	17404	8612	10256	12152	15812	13912
China Southern	Japan	8432	7016	7040	4952	8104	8888
	Korea	9888	8276	9480	11692	14800	12192
Korean Air	Korea	14504	14352	15652	18064	19752	19884
Asiana	Korea	15532	15636	18164	20164	21416	20272
Japan Airlines	Japan	14400	13924	8456	8680	8848	9408
ANA	Japan	12488	12016	12280	13664	14216	16688

Oum and Lee (2002) argue that, even in a bilateral negotiation, it is difficult to achieve air transport liberalisation unless the flag carriers of both countries are equally strong and competitive. Table 7 shows that the major carriers in the three countries do not differ much in terms of presence in the Northeast Asia markets. Therefore, it might be the right time now for the three countries to seriously consider creating an open skies zone in this region.

In 2009, CAAC introduced the one route one Chinese carrier policy on the long-haul international routes to prevent cut-throat competition between Chinese carriers, particularly during the economic downturn. The long-haul routes refer to those with a distance of more than 4500 km and are mainly the routes from China to the US and Europe. In 2018, the policy was revised in the advent of the opening of the second international airport in Beijing and at a time when more and more Chinese could afford overseas travel and Chinese carriers had

increasing interests in opening new international routes. The new Measures on International Traffic Rights Resource Allocation and Use aims to establish a sound, open, fair and just management system for international traffic rights resource allocation and use.

The new Measures divide international routes into two classes. Class 1 air routes are those from China to countries with open skies or partial open skies agreements. These countries include ASEAN countries, Australian, Chile, Maldives, Georgia, the US, the UK, New Zealand, Norway, Denmark, and Sweden. For Class 1 routes, there are no restrictions on the number of designated carriers, flight schedules, frequency, and transport capacity. Class 2 international air routes are the markets with no liberal bilateral arrangement which are divided into long-haul Class 2 international air routes and non-long-haul Class 2 international air routes. Routes to the US, Europe (excluding Russia), Oceania and Africa are long-haul Class 2 international routes. A competition mechanism will apply for those (including new entrants) that want to fly on these routes. That is, a point system will be used to decide who will be the winners among the applicants. Other routes are called non-long-haul Class 2 international routes and there is no limit on the number of designations. This policy has drawn wide attention and sparked much discussion as it represents a new milestone of China's international air transport. The implementation of this policy will undoubtedly increase competition and drive down prices on some long-haul international routes.

#### 4. Conclusion

There is no doubt that China will overtake the US to be the largest aviation market in the near future thanks to the rapid growth of China's domestic and international aviation market. Deregulation or liberalisation measures after 2003 has contributed to this outcome. The liberalisation moves include the introduction of private capital into China's air transport, leading to the two waves of the establishment of private carriers and LCCs in 2005 and 2013, respectively. These new entrants, together with the emergence of HSR, put much competitive pressure on the air transport industry and create momentum for Chinese carriers to seek improvement in efficiency and competitiveness as well as new markets. In the meantime, China has taken a different attitude towards the liberalisation in its international air transport. Liberal arrangements have been made with some major markets including the US, ASEAN, Korea, Japan, etc. These open and liberal arrangements have given the Chinese carriers the room to grow and the chance to become stronger. They in turn call for more liberalisation

moves to allow them to participate in the provision of more international air transport services.

However, the recent trade disputes between China and the US, and Brexit have put a cloud and uncertainty over the air transport sector. Worldwide demand for air freight fell 4.7 in April 2019 compared with the same period in previous year, and a larger fall was recorded among the Asia Pacific region, according to the IATA data. Law et al. (2018) also notice that for decades the US carriers were firm supporters for air transport liberalisation, but recently they asked the government to end open skies agreements with Qatar and United Arab Emirates to stop allowing the Gulf carriers to expand in the US market in the excuse that the gulf carriers received subsidies from their government and competed unfairly on the transatlantic route. Similar voice was also expressed in Europe. It would be interesting to keep a close eye on how the rise of global protectionism impact China's air transport liberalisation process, which is possibly a new research topic worth examining.

#### References:

Chen, Z. (2017). Impacts of high-speed rail on domestic air transportation in China. *Journal of Transport Geography*, 62, 184-196.

Doganis, R. (2001). *The airline industry in the 21st century*. Londres, 1<sup>o</sup> Ed. Routledge.

Fu, X., Lei, Z., Wang, K., & Yan, J. (2015). Low cost carrier competition and route entry in an emerging but regulated aviation market—The case of China. *Transportation Research Part A: Policy and Practice*, 79, 3-16.

Hadas, Y., Gnecco, G., & Sanguineti, M., 2017. An approach to transportation network analysis via transferable utility games. *Transportation Research Part B: Methodological*, 105, 120-143.

Law, C. C., Zhang, Y., & Zhang, A. (2018). Regulatory Changes in International Air Transport and Their Impact on Tourism Development in Asia Pacific. In *Airline Economics in Asia* (pp. 123-144). Emerald Publishing Limited.

- Lei, Z., & O'Connell, J. F. (2011). The evolving landscape of Chinese aviation policies and impact of a deregulating environment on Chinese carriers. *Journal of Transport Geography*, 19(4), 829-839.
- Lei, Z., Yu, M., Chen, R., & O'Connell, J. F. (2016). Liberalization of China–US air transport market: Assessing the impacts of the 2004 and 2007 protocols. *Journal of Transport Geography*, 50, 24-32.
- Li, H., Strauss, J., & Lu, L. (2019). The impact of high-speed rail on civil aviation in China. *Transport Policy*, 74, 187-200.
- Ma, W., Wang, Q., Yang, H., and Zhang, Y. 2019. Is multimarket contact an antitrust concern: a case of China's airline market. *Transportation Research Part A: Policy and Practice*, forthcoming.
- Oum, T. H., & Lee, Y. H. (2002). The Northeast Asian air transport network: is there a possibility of creating Open Skies in the region?. *Journal of Air Transport Management*, 8(5), 325-337.
- Pagliari, R. (2010). Trends in Air Service Development within the Highlands and Islands of Scotland 1983–2006. In *Air Transport Provision in Remoter Regions*. Ashgate Publishing Cornwall, UK.
- Xia, C. 2014. Understanding the development of China's private airlines. 30-2014-0482, available at <http://news.carnoc.com/list/296/296880.html>.
- Yu, H., Zhang, Y., Zhang, A. & Wang, K. 2019. A comparative study of airline efficiency in China and India: A dynamic network DEA approach . Unpublished manuscript, University of Southern Queensland.
- Zhang, A., Wan, Y., & Yang, H. (2019). Impacts of high-speed rail on airlines, airports and regional economies: A survey of recent research. *Transport Policy*. In prese.
- Zhang, A., & Chen, H. (2003). Evolution of China's air transport development and policy towards international liberalization. *Transportation Journal*, 31-49.
- Zhang, Y. (2015). Merger between airlines in financial distress: does the merger save them?. *Competition and Regulation in Network Industries*, 16(1), 66-81.

Zhang, Y., & Findlay, C (2011). Quantifying the impacts of structural reforms on air traffic flows in APEC economies. In: The impacts and benefits of structural reforms in transport, energy and telecommunications sectors. APEC Policy Support Unit.

Zhang, Y., & Findlay, C. (2014). Air transport policy and its impacts on passenger traffic and tourist flows. *Journal of Air Transport Management*, 34, 42-48.

Zhang, Y., & Round, D. K. (2008). China's airline deregulation since 1997 and the driving forces behind the 2002 airline consolidations. *Journal of air transport management*, 14(3), 130-142.

Zhang, Y., & Zhang, A. (2016). Determinants of air passenger flows in China and gravity model: deregulation, LCCs, and high-speed rail. *Journal of Transport Economics and Policy (JTEP)*, 50(3), 287-303.

Zhang, Y., & Zhang, A. (2017). Air transport development: a comparative analysis of China and India. In *Air Transport Liberalization*. Edward Elgar Publishing.

Zhang, Y., Zhang, A., Zhu, Z., & Wang, K. (2017). Connectivity at Chinese airports: The evolution and drivers. *Transportation Research Part A: Policy and Practice*, 103, 490-508.

Zhu, Z., Zhang, A., & Zhang, Y. (2018). Connectivity of intercity passenger transportation in China: A multi-modal and network approach. *Journal of Transport Geography*, 71, 263-276.

Zhu, Z., Zhang, A., Zhang, Y., Huang, Z., & Xu, S. (2019a). Measuring air connectivity between China and Australia. *Journal of Transport Geography*, 74, 359-370.

Zhu, Z., Zhang, A., Zhang, Y. 2019b. Measuring multi-modal connections and connectivity radiations of transport infrastructure in China. *Transportmetrica A*, forthcoming.