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중국 항공운송시장특성에 관한 연구

A Study on Characteristics of Chinese Civil Aviation Market

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요약

국제자유무역주의가 지속적으로 확대됨에 따라 국가 간의 항공협정에서 민감한 문제로 제한하고 있던 운항에 관한 제반 조건을 항공사가 시장상황에 따라 자유롭게 결정할 수 있도록 하는 항공자유화(Open Skies policy) 정책이 세계적으로 확산되고 있다. 범세계적으로 이해당사국간, 다자간 협정방식으로 항공자유화가 추진되고 중국항공시장에도 도입됨에 따라 항공사간 무한 경쟁이 예고되며 항공사의 경쟁력, 국제공항의 허브화, 항공수요의 변화가 주목되고 있다. 최근 중국은 대외무역의 급격한 성장과 함께 세계 제2위의 항공시장으로 성장하였다. 또한 다른 나라들과의 양자간 항공자유화 협정이 체결됨에 따라 중국의 항공시장구조와 항공사의 시장지배력에 큰 영향을 미치고 있다. 따라서 중국항공시장을 이해하기 위해서는 중국의 항공자유화정책과 항공운송시장의 특징에 대한 분석이 필요하다.

본 논문은 먼저 중국의 민간항공산업에 있어서 정부와 시장의 역할에 초점을 두고 중국의 항공자유화정책의 진척상황을 조망하였다. 둘째로 시장규모, 경쟁구조, 시장집중도 및 진입장벽 등 4개 측면에서 중국항공산업구조를 분석하였다. 본 논문에서 이용한 허핀달-허쉬만지수 를 통한 실증분석 결과, 중국의 항공시장은 과점시장구조를 보이고 있는 것으로 나타났다. 끝으로 중국항공운송시장에 참여하는 항공사는 항공동맹체 가입을 적극적으로 모색하거나 여타 항공사와는 차별화된 상용고객우대프로그램(FFP) 개발 등 경쟁력 강화를 위한 조치가 필요하다는 정책적 시사점을 도출하였다.

■ 중심어 : | 중국 | 항공자유화 | 허핀달-허쉬만 지수 | 과점시장 | 상용고객우대프로그램 |

Abstract

Recently, China has expanded enormously its economic trade exchange bilaterally with other nations and developed as the second largest aviation market in the world. While open skies bilateral agreements were signed between China and other countries, the agreement processes influenced the aviation market structure and market sharing heavily. This paper analyzed the Chinese aviation market by such three angles as market scale, competitive situation, and market concentration. It is concluded that the Chinese aviation market is the oligopolistic market structure tested by the Herfindahl-Hirschman Index. Finally, suggestions are given to the airlines operating in China such as joining the air alliance, paying attention to a different frequent flyer program (FFP), etc.

■ keyword : | Chinese | Civil Aviation | Hefindahl-Hirschman Index | Oligopolistic Competitive |

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1. INTRODUCTION

Chinese airline industry was founded in the early 1950s when the country was established and needed airlines as a national instrument to carry out its policy for the government administration, trade, and tourism. Prior to 1979, the industry was a paramilitary organization with the Civil Aviation Administration of China (CAAC) as a department of air force for most of those early years. The CAAC not only acted as a regulator of civil aviation, but also directly managed the air transport services, such as flight operation, airport management, air traffic navigation and control.

It can be traced back to 2003 that the Chinese government had promoted for opening air traffic rights, after joining the WTO, on march 24th, the CAAC approved officially Hainan as the Chinese civil aviation pilot area of opening air traffic(including the third, fourth, fifth freedom)[1].

It means that Hainan would have "the most liberal of the sky in China[2]." "Open skies" step by step has promoted Hainan's tourist industry to the high level; the vigorous development of the tourist industry brought a good chance for the development of air transport in turn. Liberalization of traffic rights for a specific airport and the city is an excellent opportunity for development. After opening third, fourth and fifth freedom rights, Meilan Airports(The airport name of Hainan)was expected to become a regional aviation hub in the south China Sea, linking Vietnam, Cambodia, Philippines, Singapore, Southeast Asia overseas and radiation to the whole of China in* domestic. On December 24, 2003, Kazakhstan Airlines flied the first international flight after opening air traffic of Hainan from Almaty via Chengdu to Sanya. The number of international routes and flights between Hainan and other countries or regions has been significantly increased thereafter.

Till 2010, there were near 50 airlines which belonged to different countries including Russia, South Korea, Britain, and other countries and which had started to operate international flights in Hainan airport. The arrival flights were 72,165 (including Meilan airport and Sanya airport) while departure flights were total 72,234. Passenger throughputs were 7092069 persons with 54.76% increase rate than 2002 (4,582,625persons), about the freight throughputs were 136,923 tons with 49.30% growth rate than 2002 (54,923.4 tons)[3][4].

The Sino-US Air Transport Agreement in 2004 was a new sign of the Chinese air transport market opening, which was intended to further expand the aviation relationship between China and the US. And the first round of the Sino-US Aviation Meeting was held in Beijing from April 19 to 20 on 2006. Since then, a new air transport agreement was signed between China and Singapore[5]. More or more foreign airlines paid close attention to operate in China for the benefit from the open skies and continued to share the rapid growth of the Chinese economy and foreign trade. For example, under the Sino-US aviation agreement, there were three other US carriers in the DOT's evaluation, namely American Airlines that had applied to fly between Dallas/Fort Worth and Beijing, Continental Airlines seeking daily nonstop flights between New York and Shanghai, and Northwest Airlines that applied for a Detroit-Shanghai daily nonstop service then. American Airlines launched a daily nonstop service between Chicago and Shanghai in the spring of 2006. Being compared with the US airlines, the Chinese airline enterprises operated difficulty in US.

Till 2007, according to the effect of the implementation of the 2004 Sino-US aviation agreement, the U.S. carriers have operated all international routes negotiations exhausted, but for

Chinese carriers, at least half of the air rights have not yet been used.

In July 2007, an expansion of the air transport market access agreement was signed, which was amendments to the 2004 Sino-US civilian Air Transport Agreement. According to it, the Chinese aviation enterprises can have immediately unrestricted access to the China-US air transport market. On the basis of the provisions of the 2004's agreement about third-party code-sharing, chartering and passenger traffic rights, the air cargo market between the two countries would be opened more widely in 2011.

In passenger market, from 2007 to 2012, the US passenger capacity of international air routes from United States to the eastern part of China increased a total of 70 classes weekly year by year on the basis of the agreement in 2004. It will be completely open of the passenger market operating from the central Chin (Anhui, Hunan, Hubei, Jiangxi, Henan, and Shanxi) to United States.

Beside the civil aviation agreements listed above, China also negotiated with the E.U. on open skies agreement in October 2004. However, the China has been refusing to take the Nationality Clause of the E.U. Chinese government announced that China would open air cargo market further under aggressive, gradual and orderly rules[6].

Along with the implementation of the Chinese policy of air transport towards "open skies", the foreign aviation enterprises which early entered China had started increasing their investment in the Chinese market, too. Accompanying with the merger and reorganization of the Chinese aviation enterprises since 2002, Characteristics and market concentration of China's civil aviation have changed from then. It will generate new commercial opportunities and change the framework of competition, market structure and security in China's air transportation market. Furthermore, it creates the prospect of additional investment and market access opportunities in the future. The change of the Chinese aviation market can influence the Northeast Asian regional aviation development; even more it can hold an important role of world aviation industry[7][8].

The objects of the study can be defined as follows: to explain the changing of the Chinese aviation policy towards "open skies", to analyze the marketing structure and competitive situation of the Chinese aviation industry, and to give some suggestion for the airlines operating in China.

Hwa Suk Lee, Jin Lee[9] discussed the aviation market in the Far East Asia early 2000 and based on the positive effect of aviation liberalization. His study focused on inter-government level from the middle part of 2000 in the Chinese laws and regulations in relations with aviation industries maintained a relatively open stance, but the data were selected from air routes between China and Korea. The main point of the paper was that Chinese laws and regulations of the aviation industries have maintained an open stance in the early part of 2000 but turned into a protective attitude since the end of 2000. Chinese researchers, Zhang, A. and Zhang, Y[10] emphasized the importance of passengers and cargoes used by 'belly cargo' from a model of air cargo liberalization in 2005. His research shown that all-cargo carriers might have different routing needs than passenger carriers and thus required different sets of air traffic rights from those needed by passenger carriers. Geloso Grosso, M and B. Shepherd[11] analyzed the regulation and effects of air cargo transport in APEC, they considered that more liberal air services policies would be positively, significantly and robustly associated with higher bilateral trade in merchandise, and air transport policy matters more for some sectors than for others. Massimo Geloso Grosso[12] discussed the Impact of liberalizing air transport services in APEC, the results implied that if APEC economies eased air transport restrictions to double the ALI(Air Liberalization Index) scores with their aviation partners, both within and outside the APEC region, traffic would increased.

As we listed above, even there were some researches (researches X) that had focused on China's air transport market, but a lot of them focused on descriptive analysis to reference published data or just from a policy perspective. A scanty number of them had concentrated on China's aviation market characteristics under China's opening air traffic rights. So it is necessary for us to concentrate on this and give some suggestion to the airlines which are operating in China now.

2. AIR ROUTES AND MARKET SCALE

Since the Airline reform which began in the late 1970s as part of the Chinese general economic reform and "open door" policy, especially after China joined WTO in 2001 and liberalized the air traffic rights towards "open skies", Chinese air routes and size of the aviation market have continued to expand[13].

China has been taking the aviation policy towards “open skies” since 2002, there was a rapid development of airline's industry, and meanwhile, some obvious changes were shown in its aviation market.

Till the end of 2010, there were total 1880 air routes, the air route mileage according to the repeat distance calculation was 3.981 million km and air route mileage of non-repetition distance was 2.765 million km. During Chinese "Eleventh Five-Year" (2006-2010), the regular flight routes increased 623 with an average annual growth of 8.4%, the repeat distance calculated route mileage raised 1.256 million km with an average annual growth of 7.9% and the calculation of non-repetition distance route mileage raised 7.67 million kilometers with an average annual growth of 6.7%. Chinese domestic cities where operating regular scheduled flights were 172 (except Hong Kong, Macau, Taiwan). There were 43 cities where operating the route from the mainland to Hong Kong, 5 cities where operating the route linking the mainland and Macau and 32 cities operating the route linking China mainland and Taiwan[14].

Table 1. Air Routes of Chinese "11thFive-Year"

Name/Unit	Amount	Growth	AAGR
Total Air Routes : Route	1880	623	8.4
Domestic	1578	554	9.0
Of Which : HK.MC.TW	85	42	14.6
International	302	69	5.3
Repeat Distance Calculation (10 thousand KM)	398.1	125.6	7.9
Domestic	271.4	109.1	10.8
Of Which : HK.MC.TW	12.4	6.1	14.4
International	126.6	16.5	2.8
Non-Repeat Distance Calculation (10 thousand KM)	276.5	76.7	6.7
Domestic	169.5	55.2	8.2
Of Which : HK.MC.TW	12.1	6.0	14.7
International	107.0	21.4	4.6

Viewing the changes of the Chinese aviation market over the decade, especially in the period of the Chinese aviation industry "11th Five-Year (2006-2010), there was a lot of growth in the total turnover of Chinese air transportation average growth of 15.6%. The passenger turnover volume increased as an average annual growth of 14.1%, the freight of cargo and mail kept an annual average increase of 12.9%. In this period, the year average growth of passenger throughput was 14.7 %, mail and cargo turnover volume developed as a 12.3 %annual rate of growth which was far higher than the global average and the Asia Pacific region. Till 2010, Chinese passenger throughput ranked 26.8 million person-trips [Figure. 1].

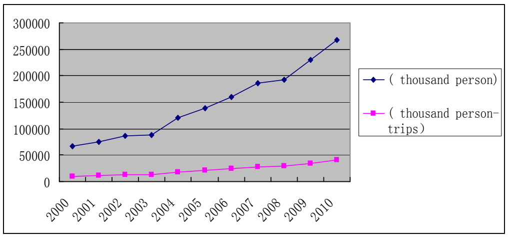

Figure. 1. Volume of passenger traffic of China, 2006-2010

Mail and cargo throughput of China was over 5630 thousand tons in 2010 (See [Figure. 2]) and keep a grow trend from 2001 to 2010. Chinese civil aviation transportation achieved new break throughputs; China has become the fastest growing and the most important civil aviation market in the world.

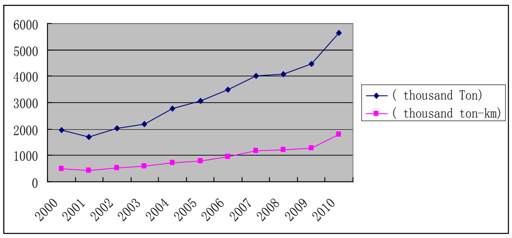

Figure. 2. Cargo throughput of China, 2006-2010

In future, Chinese civil aviation will remain an arising trend both in passenger traffic and cargo transport. The reason is there has been no structural change comparing with the coefficient of elasticity of Chinese air transport growth to GDP growth till now[15], with the continuing growth of Chinese domestic residents' income and upgrading of the travel consumption. Meanwhile, with the continuous development of Chinese foreign trade, air cargo and mail of Chinese aviation market will continue to expand too.

3. INTERNAL COMPETITION STRUCTURE

Since the restructing of the Chinese civil aviation industry in 2002, inter competition in the domestic air transport industry has been available for the following six main camps: CNAC Group (China National Aviation Corporation), Eastern Group (China Eastern Air Holding Company), China Southern Group (China Southern Air Holding Company), large Xinhua Airlines Group, private aviation, foreigner Airlines Group.

The old Air China, was founded in 1988 and operated Beijing as its main state hub. In October 2002, the old Air China combined China National Aviation Company and China Southwest Airlines and founded China Aviation Group Company according to "Civil Aviation System Reform Program". On September 30th, 2004, it was approved by the state-owned Assets Supervision and Administration Commission of State Council (SASAC) as the main air transport company controlled by China Aviation Group, Air China has made profits for seven consecutive years since 2001, which is the leading position in Chinese civil aviation industry. Air China is the only airline company which carries the national flag and it became a member of Star Alliance in December 2007.

China Eastern Airlines Corporation Limited, (formerly China Eastern Airlines established in 1988), was founded in April 1995 with the headquarters located in Shanghai. As one of the three major Airlines in Mainland China, China Eastern Airlines became the first listed company in Chinese civil aviation industry. As an official member of Sky Team, China Eastern has established an air transportation network linking all corners of the world with Shanghai, the company's major hub, and Xi'an and Kunming as its regional hubs and Taking Shanghai as the main hub.

CSAH(China Southern Air Holding Company) is one of the three major air transportation group directly managed by the State-owned Assets Supervision and Administration Commission (SASAC), specializing in air transportation and cargo logistics, China Southern Air Holding Company owns 8 subsidiaries including the listed company China Southern Airlines and 39 branches and domestic offices, as well as 53 international offices in cites, such as Los Angeles, Paris, Sydney and Tokyo. China Southern has formed an extensive network with Guangzhou and Beijing as its hubs, to span more than 150 domestic destinations.

Three companies (Air China, China Southern and China Eastern) of the six camps occupied obvious advantages compared to other airlines in total assets, fleet size, route network and so on. Private airlines usually can provide a more affordable price to the passengers and more flexible in the way of business.

Recent years, the market position of national airlines has been the challenge of the rapid rise of the other camp. From 2005 on March 11, the first domestic flight of private airlines began Okay Airways; Chinese private airlines now have Eagle Airlines, Spring Airlines, Okay Airways, East Star Airlines, Hefei Lianhua Airlines, and Shanghai Airlines auspicious.

Accompanied the opening up of Chinese aviation rights, China's aviation towards “open skies” brought increased competition, the freedom means it will be free for more foreign airlines to enter the Chinese airports according to the bilateral or multiple air traffic agreements. There are more than over 90 foreigners Airlines which has been operating in China with a large international freight market share which including the famous airlines such as lufthansa Airlines, British Airlines, United Airlines, Northeast Airlines, Nippon Airlines etc. Korean Airlines、All Nippon Airways etc[Table 2].

Table 2. Aviation Competitors in China

Group	Members
CNAC	the International Airlines, Shenzhen Airlines, Air China Cargo, Shandong Airlines, Macao Airlines, Cathay Pacific Airline, etc...
Eastern Group	Eastern Airlines, Shanghai Airlines, China Cargo Airlines, Yunnan Airlines, Wuhan Airlines, China United Airlines, etc.,
Southern Group	Xiamen Airlines, Zhuhai Airlines, China Southern Airlines,Shantou Airlines, Postal Airlines, Sichuan Airlines, etc..
large Xinhua Airlines Group	Hainan Airlines, Shanxi Airlines, Xinhua Airlines, Chang'an Airlines, China Express, etc.
Private Airlines	Eagle Airlines, Spring Airlines, Okay Airways, Juneyao Airlines, etc.
Foreigner Airlines	Korean Airlines' lufthansa Airlines. Nippon Airlines, Northwest Airlines, British Airlines etc.

4. MARKET CONCENTRATION

As analysis above, three national aviation companies (Air China, China Southern and China Eastern) have occupied domestic obvious advantages compared to other airlines. From 2007, they occupied a major share of domestic market near 75% of the total air transportation turnover.

Although the Chinese aviation market growth at an alarming rate, but China Airlines has not become the biggest beneficiary of this growth, Chinese market share is constantly being offensive rapid encroachment of foreign airlines, and its market share in international business from the gradual decline. In this study, Herfindahl – Hirschman Index was used to measure the degree of concentration of Chinese aviation market.

The Herfindahl index (also known as Herfindahl - HirschmanIndex, or HHI) is a measure of the size of firms in relation to the industry and an indicator of the amount of competition among them. Named after economists Orris C. Herfindahl and Albert O. Hirschman, it is an economic concept widely applied in competition law, antitrust and also technology management. HHI formula is listed as Eq. (1), where Si is the market share of firm i in the market, and N is the number of firms. Thus, in a market with two firms that each have 50 percent market share, the HHI value is 0.50.

$$H = \sum_{i=1}^{N} S_i \tag{1}$$

A small index indicates a competitive industry with no dominant players. If all firms have an equal share the reciprocal of the index shows the number of firms in the industry. When firms have unequal shares, the reciprocal of the index indicates the "equivalent" number of firms in the industry. Usually, a HHI index below 0.01 indicates a highly competitive index, below 0.15 (or 1,500) indicates an unconcentrated index. A HHI index between 0.15 to 0.25 indicates moderate concentration and above 0.25 indicates high concentration.

Since HHI is not influenced by the number of firms, but also can be used to measure industry concentration changes. Therefore, as the manufacturers merge, HHI index will increase; manufacturers decomposition, HHI index will be reduced. This is suitable to show the changes of merger and reorganization of Chinese aviation enterprises.

Till 2009, the cargo aviation market share of the three main airlines (CA, CZ and MU) was 60% and passenger market share was 56%. The market share data of turnover were collected from Civil Aviation Administration of China since 2002 to 2010. For example, according to the statistical data from CAAC, Air China shared about 33% of Chinese civil aviation market, Eastern Airlines shared 25%, Southern Airlines shared 24%, Hainan Airlines shared 11% and the others shared 7% in 2010, etc.

Because the main business of the airlines usually including passenger and cargo transport, we selected the total turnover (million tons-km) as the size of the market indicators, the values of passenger volume can be considered as tons-km according to the rate is 0.75 per person-km. Table 3 list the marketing share of Chinese airlines in civil aviation marketing from 2001 to 2001 which were calculated from date Statistical Data on Civil Aviation of China from 2001 to 2011[16-25]. We selected 20 airlines which ranked top 20 every year and calculated the HHI of China's aviation market. It will be not a significant effect on the calculation results because the airline's marketing share was very smaller from 21strank.

After being calculated, HHI of Chinese aviation industries from 2001 to 2010 were listed as table 4. We can see the overall of the concentration changes of Chinese aviation market after airlines restructuring, the HHI of 2001 is 0.1478 and 0.1157 in 2002, of them the HHI is near 0.15 in 2001 and more than 0.15 in 2005, it shown a downtrend of HHI from 0.1346 to 0.1031 after 2006.

We can get conclusion from [table 4] that Chinese civil aviation industry is highly oligopolistic, even after Chinese opening air traffic even HHI were more below from 2006 to 2010, it also show a type market structure of oligopolistic competitive. From the Change of NEC, effective competitors in Chinese civil aviation market has experienced from less to more, and then the changes from more to less because of Chinese airlines restructuring and opening air traffic rights.

Table 3. Marketing share of China's civil aviation transportation

Year / Rank No.	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
1	0.2449	0.2459	0.3045	0.2923	0.2848	0.2312	0.2154	0.2091	0.1995	0.1985
2	0.2149	0.1696	0.1589	0.1516	0.2202	0.2057	0.2014	0.1966	0.1883	0.1846
3	0.1681	0.1173	0.1149	0.1225	0.1697	0.1648	0.1508	0.1350	0.1391	0.1280
4	0.0600	0.0450	0.0534	0.0504	0.0488	0.0527	0.0496	0.0473	0.0519	0.0445
5	0.0557	0.0424	0.0430	0.0502	0.0419	0.0407	0.0000	0.0413	0.0510	0.0445
6	0.0355	0.0382	0.0401	0.0407	0.0346	0.0406	0.0401	0.0410	0.0364	0.0426
7	0.0318	0.0333	0.0328	0.0309	0.0322	0.0379	0.0392	0.0386	0.0360	0.0380
8	0.0268	0.0318	0.0287	0.0293	0.0316	0.0349	0.0387	0.0357	0.0334	0.0327
9	0.0010	0.0303	0.0267	0.0278	0.0248	0.0307	0.0366	0.0313	0.0314	0.0314
10	0.0087	0.0279	0.0261	0.0263	0.0192	0.0261	0.0000	0.0260	0.0309	0.0307
11	0.0358	0.0278	0.0260	0.0256	0.0161	0.0180	0.0310	0.0248	0.0248	0.0304
12	0.0337	0.0262	0.0252	0.0253	0.0119	0.0172	0.0255	0.0187	0.0179	0.0186
13	0.0203	0.0224	0.0248	0.0236	0.0111	0.0127	0.0171	0.0174	0.0165	0.0177
14	0.0157	0.0204	0.0191	0.0212	0.0104	0.0100	0.0165	0.0167	0.0142	0.0154
15	0.0172	0.0200	0.0153	0.0148	0.0080	0.0085	0.0148	0.0130	0.0129	0.0149
16	0.0129	0.0152	0.0123	0.0125	0.0064	0.0081	0.0145	0.0126	0.0125	0.0143
17	0.0084	0.0121	0.0111	0.0097	0.0061	0.0072	0.0129	0.0094	0.0121	0.0137
18	0.0043	0.0104	0.0063	0.0081	0.0048	0.0055	0.0123	0.0093	0.0117	0.0115
19	0.0020	0.0101	0.0052	0.0069	0.0042	0.0055	0.0108	0.0060	0.0078	0.0095
20	0.0018	0.0099	0.0049	0.0063	0.0038	0.0053	0.0079	0.0056	0.0078	0.0074

*Calculated from Statistical Data on Civil Aviation of China from 2001-2010 by author.

Table 4. Market concentration

Year	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
HHI	0.1478	0.1157	0.1437	0.1364	0.1676	0.1346	0.1216	0.1130	0.1080	0.1031
NEC	6.8	8.6	7	7.3	6	7.4	8.2	8.8	9.3	9.7

5. CONCLUSION AND SUGGESTION

5.1 Conclusion

This paper focused on the aviation market characteristics under the Chinese policy towards "open skies". The conclusions were listed as following: First, the CAAC has shown the positive trend of the liberalization of air traffic rights, we can expected that Chinese aviation policy would be toward further and truly openness. Second, there would be more competitors in Chinese aviation market whose property was private or foreign, which would bring increasingly fierce competition within the industry. Third, even the aviation market concentration has changed there years, but overall it still was a typical oligopolistic market. At last, because the high regulation characteristic, we can declare that the barrier to entry of Chinese aviation industry is higher than other industries in policy and fund as other countries.

5.2 Suggestion

In order to adapt to the impact of Chinese policy of opening air traffic rights and the fierce competition, aviation enterprises operating in the Chinese aviation market should pay attention to their business, for example, to offer passengers suitable flight schedule, comfortable service and competitive prices. In addition, appropriate business strategy is necessary[26], such as the establishment of air bases, logistics service organizations, integrated logistics, cost control. Third, from the trend of increasingly open global "sky liberalization" and the national air traffic rights, airlines should give adequate attention to the role of hub airports, scientific route structure and utilities of joining world air alliance , such as to expend ones original network through "code share planning", "total business cooperation model" and other effective cooperation with alliance members.

5.3 Implication and Limitation

The practical implications of this study can listed as below. First, it will be helpful for Chinese airlines to pay a closer attention on the changing of marketing structure and competitive situation of aviation industry since China has adopted its "open skies". Second, the airlines which are operating in China can get some recommendations from this paper, especially to the foreign airlines and private airlines.

The main limitation of this study is that all the date was collected from China's official publications in order to keep the consistency of the data, sometimes it may be different with the data announced by airlines. It is necessary for us to collect more details from every airline and compare them with official statistics in future research.

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