Academic Journal of Management and Social Sciences
ISSN: 2958-4396 | Vol. 5, No. 2, 2023

The Impact of EU and China Comprehensive Agreement on Investment on the Prospects of China's Air Transport Industry

Lina Yu [1], Tianyi Li [1], Tao Wang [2,*], Yifan Li [2]

[1] Ocean University of China, School of Economics, Qingdao 266100; China
[2] Graduate School of International Studies, Hanyang University, Seoul, 04763, Republic of Korea

*** Corresponding author:** Tao Wang (Email: oucwangtao@163.com)

These four authors are co-first authors

Abstract: EU and China Comprehensive Agreement on Investment (CAI) is aimed at setting up a bilateral investment system between China and Europe. Although there are few provisions about air transportation in CAI, it is undoubted that the signing of CAI will have a certain influence on the development of Chinese air transportation industry. This paper makes an analogous analysis of the development process of Chinese and American air transport market. The results show that the aviation market between China and Europe has great potential for development. The study has suggestive significance for Civil Aviation Administration to formulate and enhance the comprehensive strength of China's air transport and innovate policy management.

Keywords: EU-China Comprehensive Agreement on Investment; China's Air Transport Industry; Analogical Market Analysis; Bilateral Air Transport Relations.

1. Introduction

Aviation is a strategically important industry (Helmold, 2020). As early as 1987, the European Union proposed the first liberalization package for scheduled air transport. In 1992, the third EU programme fully liberalized the air transport market (Kassim and Stevens, 2010). In 2007, the EU signed an air transport agreement with the US to replace previous separate bilateral agreements. The agreement liberalizes capacity, rates and the market regulation, which means that the transatlantic aviation market is further consolidated. With the development of the world economy and the advancement of aviation liberalization, more than 4,000 bilateral aviation agreements have been signed around the world. ASEAN and the European Union recently completed negotiations on the world's first air transport agreement between an association of countries. The agreement will help rebuild air connectivity between ASEAN and Europe, which has been hit hard by the Novel Coronavirus pandemic, and open up new growth opportunities for the aviation industry in both regions. It can be said that it is very valuable to study the impact of bilateral air transport agreements on the air transport industry.

After seven years and 35 rounds of negotiations, the scheduled completion of EU and China Comprehensive Agreement on Investment (CAI), announced by Chinese and European leaders on 30 December 2020, is widely regarded as mutually beneficial, but the future of CAI is unclear. While the CAI does not address traffic rights because they are subject to separate aviation agreements, China will open up in the key areas of computer reservation systems, ground handling and selling and marketing services. Overall, it helps to narrow the competitive gap between internal and external Europe (Ellis, 2020). China has also removed its minimum capital requirement for rental and leasing of aircraft without crew, going beyond General Agreement on Trade and Service (GATS). And in the context of protectionism, which has a certain degree of regulation on air transport (Abeyratne, 2015), the author believes that CAI may promote the formation of a more open China-EU air transport market.

The objective of this paper is to study how the implementation of CAI will affect the development trend of China's aviation industry. The development of air transportation mainly depends on the national macroeconomic situation and economic policies, but it is also affected by relevant laws and regulations. For example, in October 1978, the United States Congress passed the Airline Deregulation Act, which brought profound changes to the international airline business. Different from the above factors with clear directions of action, the impact of bilateral agreements on the air transport industry is complex, and we cannot completely exclude the interference of other factors from the data. Therefore, the author uses the development and course of Chinese and American air transport market to predict the development trend of Chinese and European air transport market by analogy.

The outline of this paper is as follows: Section 2 analyzed the environment of China's air transport industry according to Porter's Five Forces Model; Section 3 analyzed the environment of China's air transport market by PEST analysis; Section 4 introduced the general situation of China-Europe air transport market; Section 5 predicted the development trend of China-Europe air transport market. See Section 6 for conclusions.

2. Environmental Analysis of Air Transport Industry in China

2.1. Competitor Analysis

Currently China has nine major airlines (not including small companies such as Spring Airlines), which can be divided into three echelons. The first echelon consists of Air China, China Eastern Airlines and China Southern Airlines. They are larger and they have the majority of the market

(about 80 percent). But the first echelon is directly controlled by The State-owned Assets Supervision and Administration Commission of the State Council (SASAC), there is not much competition between them because their competition may affect their total earnings. The second echelon consists of Shanghai Airlines and Hainan Airlines. The third echelon is made up of Sichuan Airlines, Shandong Airlines and Xiamen Airlines. The second and third echelons are more regional, accounting for about 20 percent of the market.

Air transport differs from other aspects of trade in that airlines must obtain permission from the grantor State to enter the market, which restricts air transport (Abeyratne, 2015). In recent years, Civil Aviation Administration of China (CAAC) has implemented positive reform measures and gradually opened up market access mechanisms, so the second and third echelons have been developed to a certain extent. However, due to the strong power of the three major airlines, plus the lack of funds and airport facilities, as well as the grim international economic situation and the rise of oil prices, small and medium-sized airlines are struggling. At the same time, independent low-cost carriers also pose a certain threat to the traditional airlines (Sun, 2017).

2.2. Entrant Analysis

The five years since China's accession to the WTO had witnessed the greatest opening up and the fastest development in the history of China's civil aviation. With an average annual growth rate of more than double digits, China's civil aviation has ranked second in the world in terms of passenger traffic and total transportation volume.

Under the control of the strategy of promoting development by opening up, China's civil aviation actively develops air transport relations with other countries. By August 2018, China had signed bilateral intergovernmental air transport agreements with 125 countries and regions. By the end of 2019, China had a total of 5,521 scheduled air routes, including 4,568 domestic and 953 international routes, ranking second in the world in terms of total turnover (a regular press conference of the CAAC is held on October 15, 2020).

In terms of international routes, foreign airlines continue to open up routes to China, and even expand to second-tier and third-tier cities. Faced with this situation, in order to attract more airline resources, China's major airlines have gradually expanded the opening up of "fifth traffic rights". The opening of "fifth traffic rights" means that more and more foreign airlines will set up in China and domestic airlines will go abroad, and fierce competition between the two sides is inevitable. But this is not necessarily an entirely bad thing: the game theory suggests that strategic interactions among economic actors (airlines) produce outcomes related to their preferences, and that the success of their choices depends on the choice of others (Abeyratne, 2011). In other words, actual competition along certain routes are important in order to be able to reap the benefits of deregulation or liberalization (Dodgson, 1994).

2.3. Substitution Analysis

It can be seen from the composition of passenger and cargo traffic of various transportation modes in China that civil aviation takes a small proportion in the total passenger and cargo transport. There are various reasons for this result, one of the most important is that with the development of civil aviation transport industry, the reform pace of road transportation and railway transportation is accelerated, and the competitiveness is strengthened. And there is competition among operators in the air transport industry and with operators in other market segments (Miecznikowski and Tłoczyński, 2018).

As for railway transportation, on the one hand, the speed and service level of trains have been continuously improved; on the other hand, market-oriented reform of prices has also been strengthened, such as the implementation of price hearing. It can be said that there is a fierce competition between the train and civil aviation in the medium and long-distance domestic transportation. In addition, the overlapping market of high-speed rail and air transport will become larger and larger in the future (Wang et al., 2015). Therefore, the booming high-speed rail transportation is also a strong competitor.

As for road transport, it has won a growing number of passengers and freight volume in short and medium distance by virtue of its convenience, speed, low price and excellent service. With the rapid development of expressways, more and more investors begin to enter the road transport industry, which used to be a monopoly, which leads to the obvious increase in the intensity of competition in this industry, and also enhances the competitiveness of the whole industry. Its concrete manifestation is in (i)the speed, comfort and safety of passenger cars have been greatly improved (ii)airline-grade services, including trained flight attendants, free food, videos, etc. (iii)increasing shifts and providing peer-to-peer services. Therefore, the automobile poses a great threat to the civil aviation transportation industry in the close range.

Considering the characteristics and application scope of water transport, the threat of water transport to civil aviation transport industry is relatively small.

2.4. Supplier Analysis

The threat from suppliers in the air transport industry is high, which first comes from their enormous bargaining power. At present, aviation kerosene used by Chinese airlines in China is mainly supplied by China Aviation Oil (CAO). The price of jet fuel mainly consists of three parts, namely, the ex-factory price of jet fuel, the price difference between import and sale and the price difference of comprehensive procurement cost. The sources of jet fuel for CAO are mainly domestic and international. The domestic purchase price is generally determined by the state, while the international price is completely determined by the market. The price of Jet fuel has risen sharply since the 2005 (Singh and Sharma, 2015). And after years of market-oriented reform, the domestic aviation kerosene retail price has been in line with the international oil prices (paschke and Lutter, 2017). It is understood that from the end of February to the end of March 2021, international crude oil and Singapore aviation kerosene rose month on month, and the average exchange rate of the US dollar against the RMB also rose. Therefore, in April 2021, the main domestic aviation kerosene ex-factory price increased.

In addition, suppliers of airports, aviation materials and maintenance also have considerable bargaining power by determining and changing the price of supply.

2.5. Buyer Analysis

For most passengers, the ticket price is the biggest consideration. With the increasing number of domestic airlines and the rapid development of railway and road

industries, passengers have more choices and the competition is keener.

From 2015 to 2019, China's civil aviation passenger traffic has been increasing year by year. Excluding the impact of the epidemic, we can assume that with the continuous growth of domestic residents' income and the upgrading of travel consumption, the domestic civil aviation passenger traffic will still maintain a steady growth.

As for freight, air transport is preferred for some goods with short delivery period and high value (Abeyratne, 2018), but for some goods that can be transported by other means of transport, air transport has poor bargaining power.

3. Analysis of Chinese Aviation Market Environment

3.1. Political Environment

As early as 2012, the State Council issued the Opinions on Promoting the Development of the Civil Aviation Industry, "The 13th Five-Year Plan" also requires to improve the functional layout of transport airports. In response to the national call, we will build international hub airports and world-class airports in Beijing-Tianjin-Hebei region, Yangtze River Delta and Pearl River Delta, speed up the development of international aviation hubs, enhance the functions of regional hub airports, and carry out the project to build, relocate, or expand the capacity of some busy trunk airports. At the same time, we constantly improve the airport functions, speed up the construction of basic information and the construction of intermodal transport hubs and equipment upgrading to improve the construction of air transfer centers, optimize the allocation of airspace resources, and improve the regulatory system. And air cargo enterprises to accelerate the transformation of logistics, air logistics also opening up faster (Wei, 2016).

Furthermore, The Notice of the National Development and Reform Commission of the CAAC on Further Promoting the Price Reform of Domestic Air Passenger Transport of Civil Aviation, issued at the end of 2017, proposes to "give full play to the decisive role of the market in the resource allocation, promote the development of the civil aviation transport industry with higher quality, further promote the reform of pricing for domestic air passenger transport in civil aviation, and establish and improve a mechanism whereby prices are mainly determined by the market." Meanwhile, in order to support the development of civil aviation, local governments have introduced policies to support development to varying degrees.

3.2. Economic Environment

In 2019, the total transportation turnover of the industry was 129.325 billion ton-km, an increase of 7.2 percent over the previous year. 2019 Statistical Bulletin on the Development of the Civil Aviation Industry shows that the total transportation turnover of domestic air routes was 82.951 billion ton-km, an increase of 7.5 percent over the previous year, the Hong Kong, Macao and Taiwan routes completed 1.69 billion ton-km, down 3.5 percent from the previous year; and the total transportation turnover of international routes was 46.374 billion ton-km, an increase of 6.6% over the previous year.

Air transport and regional economic development are inseparable and promote each other. Accordingly, the economic environment is the most influential factor to strategy formulation of air transport industry (Teles et al., 2016). At present, China's major economic zones include the Beijing-Tianjin-Hebei region, the Yangtze River Delta region, the Pearl River Delta region and the Guangdong-Hong Kong-Macao Greater Bay Area, and the major air traffic flows are also in these regions. The GDP of Beijing-Tianjin-Hebei region in 2020 totaled 8.6 trillion yuan, the Beijing-Tianjin-Hebei Airfield Complex handled 74.359 million passengers and 1.561 million tons of cargo and mail. The total GDP of the Yangtze River Delta in 2020 is 24.5 trillion yuan, the passenger throughput of the Yangtze River Delta Airfield Complex was 161.162 million person-times, and the cargo handling capacity was 5.809 million tons. The GDP of the Pearl River Delta Region in 2020 totaled 8.9 trillion yuan, and the GDP of the Guangdong-Hong Kong-Macao Greater Bay Area in 2020 totaled 11.5 trillion yuan, then the nine PRD cities in the Guangdong-Hong Kong-Macao Greater Bay Area handled 91.481 million passengers and 3.205 million tons of cargo and mail.

3.3. Sociocultural Environment

At present, living standards have continued to improve, the structure of demand has been adjusted and optimized, and consumption has played a more fundamental role. In 2019, the Engel coefficient of national residents was 28.2 percent, and Culture and Tourism Development Statistical Bulletin 2019 shows that the number of domestic tourists was 6.06 billion, an increase of 8.4 percent over the previous year. Affected by the COVID-19 epidemic, the Engel coefficient of the national residents was 30.2 percent in 2020, the number of domestic tourists was 2.879 billion, down 52.1 percent from the previous year, and the revenue from domestic tourism was 2.23 trillion yuan, down 61.1 percent from the previous year.

Residents' consumption habits are also constantly changing, from "income decides to buy" to "interest decides to buy". At the same time, people's pursuit of health and leisure tourism concept gradually formed. In 2019, the tourism economy continued to grow faster than GDP. The domestic and outbound tourism markets were growing steadily, and the inbound tourism market was on a more solid footing. The number of inbound and outbound tourists totaled 300 million, up 3.1 percent year on year. Total tourism revenue reached 6.63 trillion yuan, up 11 percent year on year. Basic Information of Tourism Market in 2019 shows that the combined contribution of tourism to GDP was 10.94 trillion-yuan, accounting for 11.05 percent of total GDP. Direct employment in tourism reached 28.25 million, and direct and indirect employment in tourism reached 79.87 million, accounting for 10.31 percent of the total employed population in China. It is certain that air transport has obvious advantages over long distances. And the air transport industry is an important part of tourism and the world economy (Vellas and Bécherel, 1995). In recent years, people's demand for air transport has increased dramatically. This trend is driving the development of the air transport industry and, in turn, consumers will benefit from an improved passenger market (Nolan et al., 2001).

3.4. Technical Environment

There are several megatrends which affect the direction aviation is taking. And innovative technology is one of them (Abeyratne, 2020). Mobile payment has spilt over into every aspect of our life. With the progress of science and technology,

NFC technology and biometric technology have also gradually penetrated into our economic activities. The survey showed that 85.37 percent of adults used electronic payments, 2.98 percentage points higher than the previous year. The proportion of adults in rural areas using electronic payment was 76.21 percent, 4.06 percentage points higher than the previous year. The civil aviation transportation sales and the service assurance are also gradually advancing the integration of mobile technology. The wide application of electronic ticket in air transportation makes the development of B2C direct selling model based on the Internet possible. CAAC issued a Notice on Further Clarifying Issues Related to International Ticket Sales during the Epidemics on April 16, 2020, requiring airlines to adopt direct selling model for all international tickets. Furthermore, the rise of social media has enabled consumers to share their experiences with each other, and electronic consumer-to-consumer know-how exchanges has increased consumer purchase intentions and electronic word of mouth (Bigné et al., 2015). In addition, online self-check-in machines, paperless customs clearance and other technologies are gradually popularized in China. Airlines are constantly monitoring the market, studying passengers' needs, and providing modern transport services (Tłoczyński, 2021).

Moreover, management technology develops step by step, and comprehensive management also ascending. Flight scheduling decision is one of the important factors affecting flight delay (Mazzeo, 2003). In 2020, China's 41 passenger airlines operated a total of 3.521 million flights, including 3.116 million regular flights. The average flight on-time rate was 88.52 percent, up 6.87 percent points a year. Among them, air traffic control accounted for 0.75 percent of the flight irregularity, down 0.68 percent points from the same period last year. Smarter and more comprehensive ways are also being explored to manage human activities for airlines (Nishimura et al., 2020).

4. Analysis of Air Transport Market in China and Europe

In recent years, China's outbound passenger transport market has been developing by leaps and bounds, among which, the development of the civil aviation market between China and Europe has been particularly remarkable, with the market scale expanding and the route network improving day by day.

In terms of passenger volume, the China-EU civil aviation market has become the largest long-distance air transport market in China, accounting for 46 percent of China's long-distance air passenger transport market. During the 13th Five-Year Plan period, the Chinese government and some major European aviation countries have been reaching new traffic rights agreements, opening more routes and increasing the frequency of flights. By the end of 2019, 169 air routes had been opened between China and Europe, an increase of nearly double, with a compound annual average growth rate of 24 percent. The number of two-way flights reached nearly 72,000, and the China-EU market expanded unprecedentedly. Besides, there have been 13 domestic airlines and 26 foreign airlines competing and cooperating in the China-EU market, providing aviation services between 31 airports in China and 46 airports in Europe. This positive phenomenon will also promote the improvement of major airports in China, thus forming a virtuous circle (Hepting et al., 2011).

Table 1. Flights originating from China to Europe in 2019

serial number	airline two-letter code	airline name	total flight number	main city of departure/average weekly frequency
1	3U	Sichuan Airlines	619	Chengdu/11.87
2	8L	Lucky Air	160	Kunming/3.07
3	CA	Air China	7910	Beijing/112.19；Shanghai/26.39；Chengdu/8.57
4	CZ	Southern Airlines	3111	Guangzhou/25.81；Wuhan/10.72；Beijing/9.84
5	FM	Shanghai Airlines	89	Shanghai/1.67；Chengdu/0.02；Xian/0.02
6	GS	Tianjin Airlines	301	Chongqing/2,68；Xian/2,59；Tianjin/0.5
7	HO	Juneyao Airlines	141	Shanghai/2.70
8	HU	Hainan Airlines	2697	Beijing/23.97；Shenzhen/12.60
9	JD	Beijing Capital Airlines	485	Qingdao/4.83；Hangzhou/1.88；Chengdu/1.76
10	MF	Xiamen Airlines	291	Fuzhou/3.01；Xiamen/2,57
11	MU	China Eastern Airlines	3747	Shanghai/60.91；Xian/6.71；Kunming/2.57
12	TV	Tibet Airlines	71	Jinan/1,36
13	ZH	Shenzhen Airlines	157	Shenzhen/3.01

Source: IATA Airports

The schedule of flights from China to Europe in 2019 and the main cities of departure are shown in the Table 1. As can be seen from the Table 1, Air China, China Eastern Airlines, China Southern Airlines and Hainan Airlines play the main role in the competition with foreign airlines in the China-EU market. And, Air China, in particular, offered nearly 8,000 flights to Europe in 2019.

Whether the frequency of flights can reach one a day is an important index to measure the long-range international competitiveness of airlines. As can be seen from the Table 2, only in six of these major routes do domestic airlines have an average of more than one daily flight. On the Beijing-London and Beijing-Frankfurt routes, Air China operates far more daily flights than its foreign rivals.

Table 2. Daily average frequency of OD flights from China to Europe in 2019

Serial number	departure airport	origin city	destination airport	arrival city	average daily flights	average daily flights of operating company
1	PVG	Shanghai	CDG	Paris	4.63	MU 1.95; AF 1.88; CA 0.8
2	PEX	Beijing	SVO	Moscow	3.93	SU 2.57; CA 0.99; HU 0.37
3	PEX	Beijing	LHR	London	3.54	CA 2.73; BA 0.81
4	PVG	Shanghai	FRA	Frankfurt	3.53	LH 1.55; MU 1.00; CA 0.98
5	PEX	Beijing	CDG	Paris	3.51	CA 1. 81; AF 1.70
6	PVG	Shanghai	LHR	London	3.38	BA 1.39; MU 0.99; VS 1.00
7	PVG	Shanghai	SVO	Moscow	3.13	SU 2.00; MU 1.13
8	PEX	Beijing	FRA	Frankfurt	2.96	CA 1.99; LH 0.97
9	PVG	Shanghai	AMS	Amsterdam	2.19	KL 1.62; MU 0.57
10	PEX	Beijing	AMS	Amsterdam	1.98	KL 1.00; CZ 0.98
11	PEX	Beijing	MUC	Munich	1.86	CA 1.00; LH 0.86
12	CAN	Guangzhou	SVO	Moscow	1.5	SU 1.00; CZ 0.43; EO 0.07
13	PEX	Beijing	CPH	Copenhagen	1.45	SK 0.95; CA 0.50
14	PEX	Beijing	IST	Istanbul	1.42	TK 1.00; CZ 0.42
15	PVG	Shanghai	HEL	Helsinki	1.38	AY 0.99; HO 0.39

Source: IATA Airports

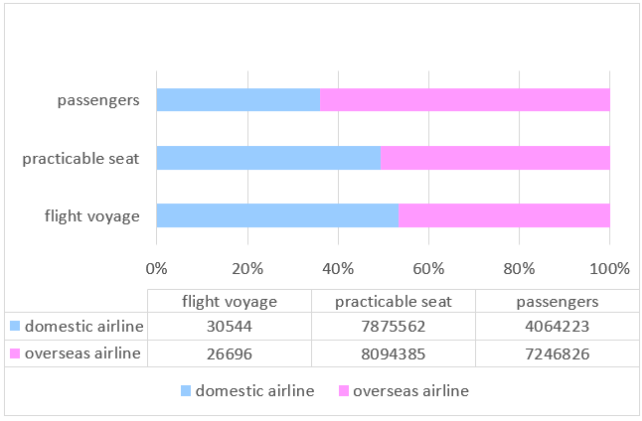

Fig 1. Market share of China-Europe routes for domestic airlines in 2016
Source: IATA Airports

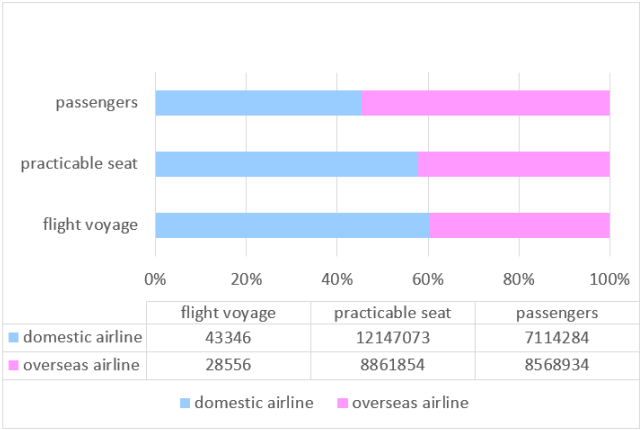

Fig 2. Market share of China-Europe routes for domestic airlines in 2019
Source: IATA Airports

According to the Fig.1 and Fig.2, by the end of 2019, from the perspective of the whole China-EU market, domestic airlines have had a certain advantage in terms of overall transport capacity. In terms of the number of flights provided and available seats, domestic airlines accounted for about 60%. In terms of the number of passengers carried, domestic airlines carried 45.36% of the passengers in 2019, still less than half of the passenger volume. Combined with the market share of available seats mentioned above, it can be seen that domestic airlines are still in the stage of market expansion. And some studies predict that the growth of air traffic between China and Europe will continue to be relatively large in the early 2030s (Vogel, 2021).

In 2020, COVID-19 broke out around the world and seriously affected the international aviation market. However, from January to May 2020, the number of tourists from China to Europe still reached nearly 880,000, with an average of 175,000 per month, according to the published data. Despite the introduction of relevant regulations in late March 2020 to prevent and control the epidemic, there are still 25 direct flights in China and Europe, carrying nearly 70,000 one-way passengers in April and May. These airlines have maintained flight operations and passenger volumes have a certain scale, which is driven by the market supply and demand (Oum and Yu, 1998).

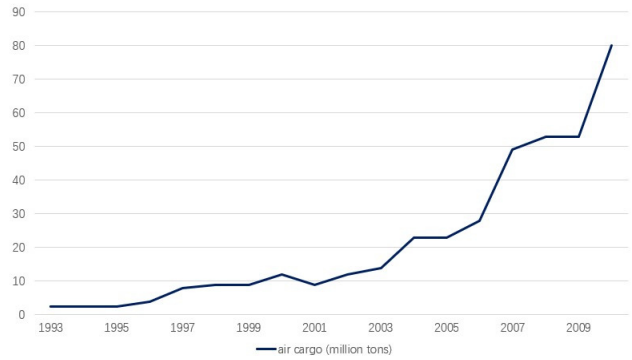

Fig 3. Total air cargo volume between China and EU member states from 1993 to 2010 (Chinese carrier)
Source: U.S. Department of Transportation

As shown in the Fig.3, the total volume of air cargo, the number of flights and the change of routes between China and Europe from 1993 to 2010, it can be seen that the increase of Chinese carriers in this market in the 1990s was very small, and the number of routes and flights between Chinese carriers and the EU has not increased significantly. In 2002, China's civil aviation enterprises began to implement strategic restructuring, and with the effect of restructuring, the total volume of air cargo between China and Europe began to increase significantly (David Bonilla, 2019). The total

number of flights from China to France, the United Kingdom, Germany and the Netherlands has increased nearly twice since 2002, compared with the same period in the 1990s.Even with the impact of the financial crisis, the decline in 2009 is well above the peak of the 1990s（China Civil Aviation Statistical Yearbook）. In addition, not all the traffic volume between China and EU member states has increased with the signing of the transport agreement, and the effect of the policy has not been shown immediately. In 2004, the EU achieved the largest enlargement in its history, with ten countries joining the bloc at once. In 2007, Bulgaria and Romania joined the EU. According to data released by the EU, trade between China and the EU has grown steadily in the ten years from 2009 to 2019. More and more high-value products are being transported by air (Gleissner and Femerling, 2013). In 2019, China-EU trade in goods totaled 560.3 billion euros, an increase of 3.78% compared with the previous year. The freight market in China and Europe has a broad prospect, and the application of air transport in it is increasingly widespread.

5. Forecast the Development Trend of Air Transport Market between China and Europe by Analogy Analysis

On September 17, 1980, the Chinese and American governments signed the Bilateral Air Transport Relations Agreement for the first time. Since then, the two sides have revised and supplemented the 1980 agreement in 1982 and 1996 respectively. In 1999, China and the United States amended the Agreement on Civil Air Services to a large extent, further enhancing the openness of the air transport markets between the two countries.

However, in the face of the rapid development of economic and trade links between China and the United States, especially the rapid growth of commodity trade between China and the United States, the agreement revised in 1999 had been unable to meet the needs of the development of the air transport market between them. Therefore, after many consultations, China and the United States signed a new supplemental agreement on civil air transport on July 24, 2004.Compared with the revision in 1999, this revision is a major breakthrough in the scope and degree of the opening of the air transport market between China and the United States. In addition to liberalizing the restrictions on the designation and capacity of air carriers, the original restrictions on charter flights, freight rates, freight hubs, multimodal transport rights, self-run ground services and business activities have also been greatly reduced or canceled.

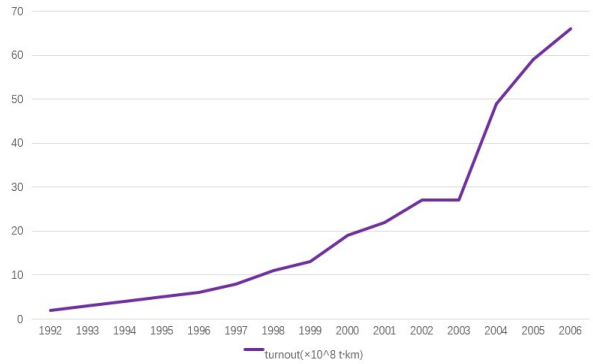

Fig 4. Turnout of China-US bilateral aviation market
Source: U.S. Department of Transportation

Based on the analysis of the air transport market between China and Europe and the air transport market between China and the United States, there is a high degree of similarity between the two markets, and we can use the development course of the air transport market between China and the United States to predict the development prospect of the air transport market between China and Europe.

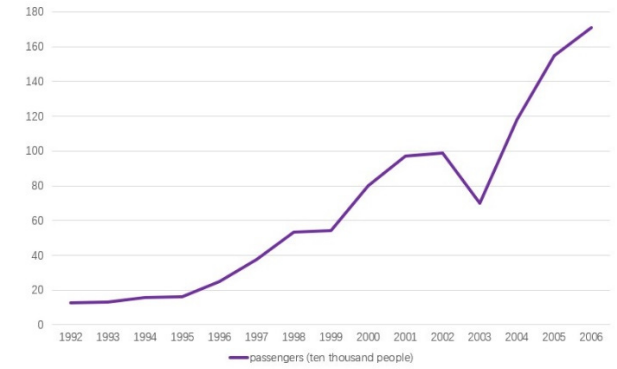

Fig 5. Passengers traveling in China-US bilateral aviation market
Source: U.S. Department of Transportation

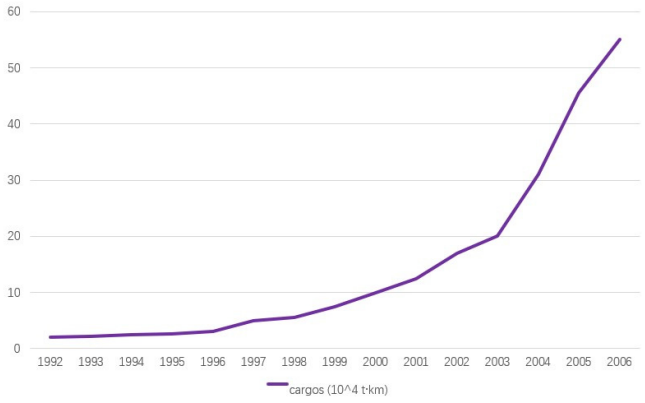

Fig 6. Cargos carried inn China-US bilateral aviation market
Source: U.S. Department of Transportation

The Civil Aviation University of China has conducted a detailed study of the impact of bilateral air traffic liberalization between China and the United States (Zheng et al., 2007). The results of this study support the effectiveness of liberalization policies in the air transport market in China and the United States. According to Fig.4, Fig.5 and Fig.6, it can be seen that the newly revised Air Transport Agreement between China and the United States made a significantly positive influence on the aviation market between them. What a noteworthy is that "September 11 attacks" and "SARS" have a greater impact on China and the United States air passenger transport market. However, the positive effect of institutional factors can offset the negative impact to some extent. According to the general theory of institutional economics and the experience of civil aviation at home and abroad, it can be concluded that the main reason why the air transport market between China and the United States can continue to grow under the negative impact is the revision of bilateral air transport agreement between China and the United States.

Other studies confirm that the 2004 and 2007 revisions to China and the United States Air Transport Agreement have unevenly stimulated the two countries' markets. (Zhou and Chen, 2018) And many indicators show that the opening up of the bilateral air transport markets has increased the market supply, benefited airlines and passengers of the two countries,

and would ultimately lead to a win-win situation.

6. Conclusion

Excluding negative factors of international civil aviation business caused by the black swan event such as COVID-19, in general, the future development trend of the civil aviation market in China and Europe is positive, with huge potential, but the market competition is also becoming increasingly fierce. Although CAI was temporarily frozen at the European Conference on May 20, 2021, it is widely believed that CAI will not only benefit China and the EU, but also boost the recovery of the world economy in the post-epidemic era and promote the liberalization and facilitation of global trade and investment (Lai et al., 2019). For EU companies, it will mean greater market access, better legal protection and a better competitive environment in China. And the CAI would help to rebalance trade and investment relations between the EU and China, according to the Portuguese daily El Public (The European Union).

In view of the high similarity between the China-Europe air market and the China-US air market in terms of start-up time, openness and policy support, it can be concluded that the implementation of the Agreement will greatly enhance the investment and economic and trade relations between China and the EU, and it is undoubtedly a positive signal of policy guidance for the air transport industry. Based on the previous analogy, CAI is likely to promote the faster and better development of the China-EU air transport market. If the relevant Chinese authorities can introduce policies to improve the ancillary transport services and service quality in due time, I think it will be of significant help to the economic development of both sides and China's becoming the world's aviation logistics center.

Judging from the history of the aviation market in the United States, the development of passengers and cargo aviation in China needs to be more professional.

About passenger transport, according to the previous analysis, the development of the passenger transport market between China and Europe is stable and improving. One of the main reasons is that China's international hub construction has achieved remarkable results in recent years. The China should reduce aviation costs to further increase the hub's influence (Guo et al., 2019), continue to improve relevant auxiliary air transport services and provide more diversified services for the China-Europe air passenger transport market. For example, customers are clustered into different market segments to provide more suitable products and services (Boudia et al., 2021).

In terms of cargo, the air cargo market between China and Europe has huge potential. And CAAC should help Air China, China Southern Airlines and China Eastern Airlines to clarify new ideas for the development of cargo, and also need to introduce relevant policies to guide the construction of a stronger integrated air cargo logistics enterprises. At the present stage, domestic airport resources are limited, and there is a phenomenon of "heavy passenger and light cargo" in the resource allocation. The transport structure of China's three major aviation groups mainly focuses on passenger transport, which also restricts the development space of cargo airlines to a certain extent. Therefore, the relevant departments should realize innovation from the policy management, change the concept of "heavy passenger light cargo", promote the construction of the airport which focuses on cargo business, and provide institutional and resource guarantee for the development of the market of air cargo companies. At the same time, the market outlook for air transport of bulky and heavy cargo should also be paid attention to in order to respond to changes in market demand in advance (Gavrilova and Gyazova, 2021). China's shipping industry will attract more trade partners because of the continuous improvement of service quality and transportation strength. If CAI can be successfully implemented on the basis of equality and win-win between China and Europe, it will also open up China's international shipping market.

Acknowledgments

Funding: This research was funded by [Shandong Provincial Philosophy and Social Sciences Work Office] grant number [23CJJJ39].

References

[1] Marc Helmold, 2020. Pricing in the Aviation industry. Total Revenue Management (TRM) pp 129-137.

[2] Hussein Kassim and Handley Stevens, 2010. Completing the Single Market in Air Services. Air Transport and the European Union pp 105-129.

[3] Darren Ellis, 2020. Internal versus external European air market realities: the competitive divide. European Transport Research Review 12, Article number: 18 (2020).

[4] Ruwantissa Abeyratne, 2015. Market Access and Subsidies in Air Transport: The US-UAE Debate and WTO. Competition and Investment in Air Transport pp 113-130.

[5] Ruwantissa Abeyratne, 2015. Competition and Innovation in Air Transport. Competition and Investment in Air Transport pp 73-111.

[6] Joo Yeon Sun, 2017. Airlines Deregulation and Its Impacts on Air Travel Demand and Airline Competition: Evidence from Korea. Review of Industrial Organization 51,343-380 (2017).

[7] Ruwantissa Abeyratne, 2011. Sustainable Development of Air Transport. Strategic Issues in Air Transport pp 319-394.

[8] J. S. Dodgson, 1994. Competition policy and the liberalization of European aviation. Transportation 21, 355-370 (1994).

[9] Stanisław Miecznikowski and Dariusz Tłoczyński, 2018. Market Factors Influenced for Air and HSR Services. Case Study at the Route London-Paris. Directions of Development of Transport Networks and Traffic Engineering pp 41-51.

[10] Jiaoe Wang, Jingjuan Jiao, Chao Du and Hao Hu, 2015. Competition of spatial service hinterlands between high-speed rail and air transport in China: Present and future trends. Journal of Geographical Sciences 25, 1137-1152 (2015).

[11] Vedant Singh and Somesh Kumer Sharma, 2015. Fuel consumption optimization in air transport: a review, classification, critique, simple meta-analysis, and future research implications. European Transport Research Review 7, Article number: 12 (2015).

[12] Marian Paschke and Carina Lutter, 2017. Regulatory Framework of Global Aviation. Biokerosene pp 59-92.

[13] Ruwantissa Abeyratne, 2018. Price Fixing and Anti-Competitive Conduct in Air Cargo Operations. Law ang Regulation of Air Cargo pp 157-201.

[14] Ran wei, 2016. Development of Air Logistics in China. Contemporary Logistics in China pp 177-190.

[15] Susana Teles, Manuela Sarmento and Álvaro Matias, 2016. Decisive Criteria for Strategic Management in the Air Transport Sector. Impact Assessment in Tourism Economics pp 157-169.

[16] François Vellas and Lionel Bécherel, 1995. Air Transport and Tourism. International Tourism pp 119-162.

[17] J. F. Nolan, P. C. Ritchie and J. E. Rowcroft, 2001. Open skies and open gates. Transportation 28, 119-135.

[18] Ruwantissa Abeyratne, 2020. International Aviation and Megatrends. Aviation in the Digital Age pp 13-42.

[19] Enrique Bigné, Carla Ruiz, Luisa Andreu and Blanca Hernandez, 2015. The role of social motivations, ability, and opportunity in online know-how exchanges: evidence from the airline services industry. Service Business 9, 209-232(2015).

[20] Dariusz Tłoczyński, 2021. Convenience as a Factor Differentiating Air Transport Service. Transport Development Challenges in the 21st Century pp 65-75.

[21] Michael J. Mazzeo, 2003. Competition and Service Quality in the U.S. Airline Industry. Review of Industrial Organization 22, 275-296 (2003).

[22] Satoshi Nishimura, Yuichi Oota and Ken Fukuda, 2020. Ontology Construction for Annotating Skill and Situation of Airline Services to Multi-model Data. Human Interface and the Management of Information. Designing Information pp 265-278.

[23] Michael Hepting, Henry pak and Dieter Wilken, 2011. The Demand for Air Transport and Consequences for the Airports of Hamburg and Rostock. Demography and Infrastructure pp 111-129.

[24] Harold L. Vogel, 2021. Wings. Travel Industry Economics pp 57-159.

[25] Tae Hoon Oum and Chunyan Yu, 1998. The International Air Transport Industry. Winning Airlines pp 5-19.

[26] Harald Gleissner and J. Christian Femerling, 2013. Transport Systems and Logistics Services. Logistics pp 53-94.

[27] David Bonilla, 2019. Airfreight Transport in China, Trade and the Airport Network. Air Power and Freight pp 93-136.

[28] Xingwu Zheng, Lingxiang Zhang and Wei Lu, 2007. On Impact of China-US Bilateral Air Service Agreement. Journal of Civil Aviation University of China. Vol.25 No.4.

[29] Suping Zhou and Ruowei Chen, 2018. Liberalization of China-US Air Market and Impacts Analysis. Civil Aircraft Design & Research.

[30] Kee-hung Lai, Yu Pang, Christina W. Y. Wong, Y. H. Venus Lun and Y. N. Eppie Ng, 2019. Are trade and transport logistics activities mutually reinforcing? Some empirical evidences from ASEAN countries. Journal of Shipping and Trade 4, Article number: 2 (2019).

[31] Weisi Guo, Bogdan Toader, Roxana Feier, Guillem Mosquera, Fabian Ying, Se-Wook Oh, Matthew Price-Williams and Armin Krupp, 2019. Global air transport complex network: multi-scale analysis. SN Applied Sciences 1, Article number: 680 (2019).

[32] Mourad Boudia, Suraj Mohamed, Nicolas Bondoux and Thierry Delahaye, 2021. Traveler centric airline offer design and optimization. Journal of Revenue and Pricing Management (2021).

[33] Inna S. Gavrilova and Marina M. Gyazova, 2021. Analysis of the market for the air transportation of bulky and heavy cargo: trends and prospects. Journal of Revenue and Pricing Management 20, 66-75 (2021).