

## Analysis of Market Conduct and Performance of China's Civil Aviation Industry

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**Keywords:** Civil Aviation Industry, SCP Model, Market Conduct, Market Performance 1. The introduction

**Abstract:** After the reform and opening up, the rapid development of the civil aviation industry has made outstanding contributions to economic construction. With the development of the economy and the improvement of people's living standards, aviation travel has become the choice of more and more passengers. This paper first reviews the development history of which has promoted the continuous expansion of the demand in the civil aviation market and promoted the development of the civil aviation industry. China's civil aviation industry and analyzes the development status and market structure of the civil aviation industry. Then proceed from the SCP model, This article analyzes the market conduct of the civil aviation industry through price behaviors, non-price behaviors and organizational adjustment behaviors, And analyzes the market performance level by selecting the output level, industry scale and the operational capability of the civil aviation industry, And then studies the relationship between the market conduct and performance. Through analysis, It is found that China's civil aviation industry still has the characteristics of oligopoly structure under government regulation, And its pricing is greatly affected by cost and regional development differences, affecting its profitability. Under the background of rapid development of civil aviation industry, service quality still needs to be improved. Vitality and market vitality is still enough. In order to effectively improve the competitiveness of the civil aviation industry and achieve a higher quality development, The government should speed up the transformation of functions, create a foreign market competition environment, and relax the government rules and regulations. Enhance the vitality of the civil aviation market competition, and strengthen infrastructure construction, promote the development of the civil aviation balance, Break the administrative monopoly of upstream products to reduce the costs.

As an important infrastructure, civil aviation plays an important role in China's economic development. For a long time, China's civil aviation industry has been protected and supported by the government. In the process of reform and opening up, China's civil aviation industry has also gradually promoted policies such as the relaxation of entry and price control, which to a large extent promoted the development of civil aviation industry and continuously improved its international competitiveness. At present, the market size of China's civil aviation industry has been the world's second largest for many years. With the development of economy, people's quality of life is improving day by day, and the demand for air travel is increasing, which also puts forward higher requirements for the types and levels of services of civil aviation industry. In addition, the international air transport market is gradually developing and maturing, and economic globalization has promoted the increasingly fierce competition among the civil aviation industries of various countries. The development of the domestic and international aviation market has brought opportunities and challenges to the development of civil aviation in our country, which urges China's civil aviation industry to meet people's diversified market demand and achieve high-quality development. At the same time, it also needs to introduce the foreign advanced management experience, strengthen technology research and development on the basis of learning from foreign advanced technology, and take the road suitable for the development of China's civil aviation industry in combination with national conditions. In this context, it is of great practical significance to study the market conduct and market performance of civil aviation industry.

This paper studies the market conduct of China's civil aviation industry from the perspectives of price behavior, non-price behavior and organization coordination behavior. At the same time, it analyzes the output level, industrial scale and operation capacity of the civil aviation industry through recent data. Based on the analysis of market conduct and market performance, it discusses the deficiencies in the development of China's civil aviation industry, and puts forward corresponding policy recommendations.

## 2. Analysis of the Market Organization Structure of China's Civil Aviation Industry

The market structure of China's civil aviation industry can be calculated based on some published data. According to the semi-annual report of 2018 released by civil aviation administration of China and major airlines, China's civil aviation industry achieved a total operating revenue of RMB 413.54 billion in the first half of 2018, including RMB 67.52 billion for China Southern Airlines, RMB 64.242 billion for Air China, RMB 54.422 billion for China Eastern Airlines and RMB 32.941 billion for Hainan Airlines.<sup>[1]</sup> This can be used to calculate the industry concentration, namely:

$$CR_4 = (67.52 + 64.242 + 54.422 + 32.941) / 413.54 = 52.99\% \quad (1)$$

According to Bain's market structure classification, civil aviation in our country belongs to the oligopolistic market III type, market concentration is high, and it belongs to the oligarchic monopoly industry. In addition, as of December 31, 2018, there are 60 air transport enterprises in China, including 45 of state-owned holding companies, and only 15 private and private holding companies, indicating that China's civil aviation market competition vitality has not yet been fully inspired, private capital is weak. China's civil aviation has the characteristics of the oligopoly structure under the government regulations.

## 3. Market Conduct Analysis of China's Civil Aviation Industry

This paper analyzes the market conduct of civil aviation enterprises mainly through price behavior, non-price behavior and organizational structuring behavior.

### 3.1 Price behavior

This paper mainly studies the factors influencing airline pricing behavior. The factors that affect the pricing behavior of airlines mainly include cost, market demand, market competition and other factors, etc. This paper mainly analyzes the influence of the first two factors on the pricing behavior of airlines.

The level of business costs will directly affect the level of pricing. At present, the cost of China's aviation enterprises mainly includes aviation fuel cost, airport takeoff and landing fees, employee compensation and aviation materials cost, as well as the company's own management expenses and financial expenses. Many upstream products, such as aviation fuel and airport landing and landing fees, are still monopolized pricing, and their prices are greatly influenced by domestic and foreign markets, while the bargaining room of civil aviation enterprises is relatively small. Its cost is greatly affected by the price of upstream products, and the government also imposes floating restrictions on the pricing of civil aviation, resulting in a small range of price changes for airlines. In addition, the high price of civil aviation will directly affect the reduction of its market demand and profitability. Among them, the fuel cost in the three major airlines exceeds the company's cost by 30%, which is a non-negligible expense. The impact of exchange rate on airlines' earnings is also significant. Airlines will buy new aircraft from abroad, which makes them have foreign debts for a long time. Exchange rate fluctuations tend to cause exchange loss, which increases the costs of airlines. According to the performance forecasts released by various airlines, the net profits of most domestic airlines fell off a cliff in 2018, mainly due to the sharp increase in jet fuel costs caused by the rising price of jet fuel and the exchange loss caused by the depreciation of the RMB exchange rate. In addition, aircraft cost and purchase costs are high, sunk costs are high. It can be seen that the cost will have a significant impact on the pricing behavior of each airline and directly affect its profit level.

Airlines need to take these costs into account when setting fares to ensure a certain level of profitability.

The market demand of air transport products is influenced by various factors such as economic development level, consumer income level, consumption preference, etc. Therefore, airlines will take various measures to obtain the maximum profit when setting prices. Generally speaking, countries and regions with a high level of economic development will have higher demand for tourists than countries and regions that are relatively backward. As a result, the number and frequency of people traveling is higher, and the price of air tickets is relatively higher. Different consumers assign different values to air transport products. Some consumers have a higher level of income and are willing to pay higher prices to obtain better service. When traveling, they will choose to buy first class and business class. Some consumers are more concerned about the price of air tickets, and have less requirements on the quality of service and the flexibility of the travel process. They are willing to pay a lower price, so they usually buy economy class. This differential pricing has made airlines more profitable.

### **3.2 Non-price behavior**

Non-price behaviors of enterprises include product positioning, technology development and sales activities, etc. They are behaviors unrelated to price adopted by enterprises in order to attract more customers and earn more profits. With the deepening of the market-oriented reform of the civil aviation industry, airlines have taken actions to constantly improve their development, optimize service quality and improve corporate image. This article mainly analyzes the product diversification and service quality and other aspects.

#### **3.2.1 Diversified products**

The differences in aviation products among Chinese airlines are small and the competition is not very fierce, but each company still strives to provide its own unique products. Most airlines now have frequent-flier programs and make a lot of money. China Southern Airlines' frequent flyer program known as the Pearl of Sky Pearl club, has reached reciprocal frequent flyer program benefits with American Airlines. American Airlines AAdvantage members can earn and redeem bonus miles on more than 3000 daily flights from China Southern Airlines to 224 destinations in 40 countries, and Pearl Club members can earn and redeem bonus miles on 6700 daily flights from American Airlines to nearly 350 destinations in more than 50 countries. Air China's frequent-flier program, known as Phoenix Miles, has attracted more than 56 million members by 2018, with annual frequent-flier revenue increasing 11.6 percent year-on-year.<sup>①</sup> Since January 1, 2019, Phoenix Miles has launched the "annual outstanding lifetime platinum card" for the lifetime platinum card members whose lifetime platinum card accounts have accumulated a total mileage of more than 300,000 kilometers (including) in 2018, and they can get six exclusive services in that year. The introduction of the frequent-flier program enables passengers to enjoy different product experiences in different airlines, which has helped airlines retain many loyal customers.

#### **3.2.2 Continuous improvement of service quality**

The high quality service can improve the user experience of passenger, promotes the passenger repeated consumption. China's aviation enterprises have been constantly improving the level of service, optimize the quality of service. In March 2019, British aviation consultancy Skytrax released a list of the world's 30 cleanest airlines, with three of the top 10 coming from China. Taiwan's Eva airways, Hong Kong's Cathay Pacific airways and Hainan airlines ranked second, sixth and ninth respectively. In addition, airlines are constantly innovating their services to meet the diverse needs of passengers.

However, there are still some deficiencies in the services provided by China's aviation enterprises. In January 2019, a total of 1,572 consumer complaints were received, mostly concerning abnormal flight services, ticketing services and baggage services. Therefore, China's aviation industry needs to constantly improve the level of comprehensive service quality. Only by constantly improving the

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<sup>①</sup> Date sources: <http://news.carnoc.com/list/487/487983.html>

ability to serve passengers, improving service quality and providing a comfortable and safe air journey for passengers, can it attract more passengers and promote its long-term development.

### **3.3 Organization and coordination**

The organization and coordination behavior of enterprises mainly includes the association, merger and acquisition among enterprises. This paper studies the merger and reorganization between airline alliance and airline enterprises.

#### **3.3.1 Aviation alliance is formed among aviation enterprises**

Most of the ways of cooperation among Chinese enterprises are equity investment, and there are more small proportion of equity participation among enterprises, while mergers and acquisitions are fewer. This is because most of the Chinese enterprises are highly indebted, and mergers and acquisitions will increase the financial burden of the company. However, most of the airlines with high-quality resources have the support of the local government, so it is difficult to carry out mergers and acquisitions by pure market means.

The cooperation among aviation enterprises is mainly carried out by means of interconnecting routes, code sharing, route pooling and aviation alliances, especially aviation alliances. An airline alliance is a cooperative agreement between two or more airlines. It is a very close cooperation. Airline alliances emerged in the 1990s, with overseas airlines forming Star Alliance, Oneworld and SkyTeam. Joining the aviation alliance can enjoy many conveniences provided by the alliance, and resources can be complementary and shared. At the same time, it is also conducive to the development of the international market for domestic aviation enterprises and the enhancement of competitiveness, which has promoted the major domestic aviation enterprises to successively join the three alliances.

#### **3.3.2 Merger and reorganization among airlines**

With the liberalization of the civil aviation market, the number of airlines has been increasing year by year, and the market competition has been increasing. Mergers and reorganizations are conducive to the optimization of resource allocation, the realization of economies of scale and the enhancement of market competitiveness. On October 11, 2002, Air China, China Eastern Airlines group corporation and China Southern Airlines group corporation were incorporated after merger and reorganization. Since then, China's civil aviation industry has formed a market structure dominated by the three major aviation groups and supplemented by local airlines, among which the total assets of the three aviation groups account for about 80% of civil aviation, and the fixed assets have increased to about 50 billion yuan. After this restructuring, the total transportation turnover, passenger transportation and cargo and mail transportation volume of the whole industry reached 16.2 billion ton kilometers, 84.25 million people and 1.98 million tons, respectively, up 14.9%, 12% and 15.8% over the previous year, of which the growth rate of passenger transportation volume has reached a historical high since 1996, and the benefit ratio and various economic indicators of the whole industry have been in full swing.<sup>①</sup> Since then, the merger and reorganization of civil aviation industry occurred from time to time.

## **4. Market performance analysis of China's civil aviation industry**

Under the background of government's relaxation of regulations on civil aviation industry, civil aviation enterprises constantly adjust their market conduct to adapt to the changing market environment and improve their competitiveness. Based on the analysis of market conduct, this paper analyzes the market performance indicators of China's civil aviation industry, such as output level and operation capacity, to explore the relationship between market conduct and market performance.

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<sup>①</sup> Date sources: <http://www.etmoc.com/look/Looklist?Id=2887>

#### 4.1 Output level

This paper selects the data of passenger volume, freight volume and total turnover of civil aviation from 2007 to 2018. Through the figure 1 to figure 3, it can be found that this decade, China's civil aviation has been in continuous development. The passenger volume increased from 186 million in 2007 to 610 million in 2018, the freight volume increased from 4.018 million tons in 2007 to 7.385 million tons in 2018, and the total turnover increased from 36.53 billion ton kilometers in 2007 to 120.64 billion ton kilometers in 2018. With the rapid development of China's economy and the improvement of people's living standards year by year, the price of air tickets keeps falling, which promotes the increasing demand for civil aviation products and promotes the gradual expansion of the market of civil aviation industry. At the same time, the in-depth development of the market-oriented reform of the civil aviation industry has enhanced the competition vitality of the civil aviation market, prompting airlines to take various measures to improve their competitive strength, improve their ability to serve passengers and ensure economic benefits. The sustainable development of civil aviation industry also promotes the economic and social development and the improvement of people's living quality, creates more and more social welfare.

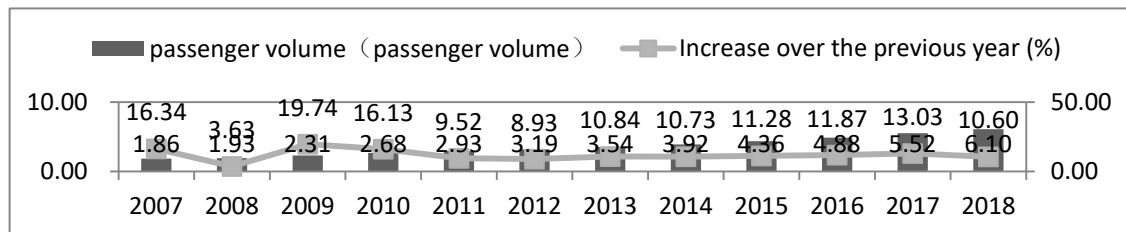


Figure 1 civil aviation passenger volume(2007-2018)

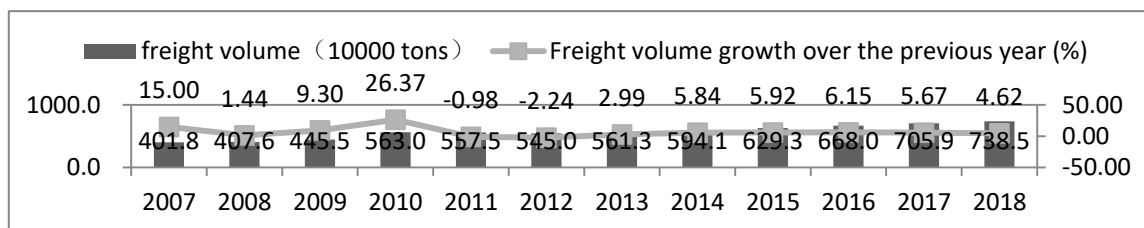


Figure 2 air freight volume (2007-2018)

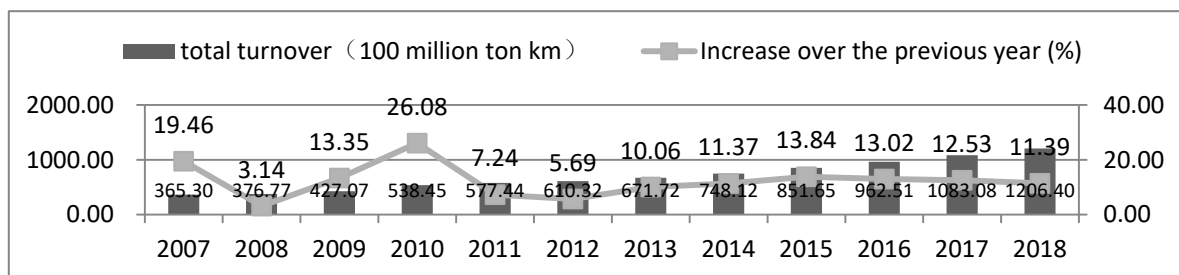


Figure 3 total turnover of civil aviation (2007-2018)

Date sources: national bureau of statistics. China statistical yearbook 2008-2018[M].Beijing: China statistics press, 2008-2018;Civil aviation resource net, <http://news.carnoc.com/list/476/476637.html>

#### 4.2 Operational capability

Operational capacity can reflect the efficiency of resource utilization within an industry, and reflect its ability to serve users and its performance level. This paper analyzes the performance of civil aviation services by selecting the data of regular passenger load rate and load rate of China's civil aviation industry from 2009 to 2017. Regular passenger load factor refers to the ratio of the number of

paying passengers carried by air to the total number of available passengers, while the load rate factor refers to the ratio of the average charged TKM carried by air aircraft to the total available TKM. As can be seen from figure 4, both the regular passenger load rate and the load rate of China's civil aviation industry are on the rise, which indicates that China's civil aviation industry's operation capacity is constantly enhanced and the effective utilization of resources is improved, thus expanding the profit space of airlines. In addition, through comparison, it can be found that the load rate of China's civil aviation industry has always been lower than the passenger load rate, which indicates that the cargo load rate is lower than the passenger load rate, and the market demand for cargo transportation is lower than the market demand of passengers for civil aviation products. Although the operation capacity of China's civil aviation industry has been enhanced year by year and it has gradually developed into a major civil aviation country, compared with developed countries, the on-duty passenger load rate and load rate of China are significantly lower. Therefore, China still needs to further promote the optimized allocation of civil aviation resources, fully develop market demand and stimulate its development potential.

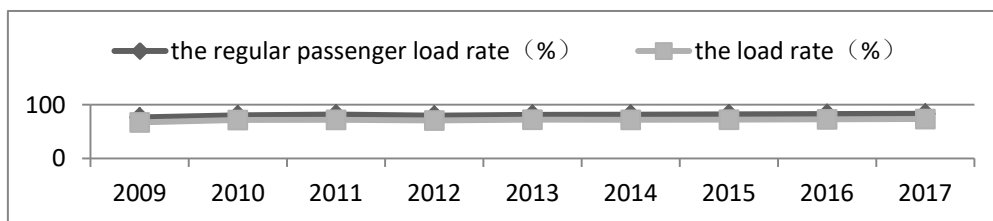


Figure 4 changes in regular load factor and load rate (2009-2017)

Data sources: Civil Aviation Administration of China, <http://www.caac.gov.cn/INDEX/>

## 5. Relationship between market conduct and market performance of civil aviation industry

By analyzing the market conduct and performance of China's civil aviation industry, we can analyze the relationship between market conduct and market performance from the following aspects.

### 5.1 Price reform and diversified development of aviation enterprises have promoted the continuous expansion of industrial scale

Since the reform and opening up, with the continuous relaxation of the government's regulations on civil aviation fares, the independent pricing power of airlines has been gradually enhanced, and the price of air tickets has been continuously reduced, which promotes the increase of people's demand for air travel and the gradual expansion of the civil aviation market. In addition, the relaxation of market access conditions has led to an increase in the number of civil aviation enterprises, the strengthening of civil aviation supply capacity and the expansion of industrial scale. The various policies launched by various airlines not only meet people's diversified needs, but also increase their operating income.

### 5.2 Changes in airline costs affect their profit levels

The cost change of each aviation enterprise will affect its pricing strategy, thus affecting the level of profit. Aviation enterprise's upstream products especially aviation fuel costs accounted for larger proportion of total cost, and the cost of this part which is affected by the domestic and international market prices is hard to control. The government's restrictions on the proportion of rising ticket prices and cross industry competitive pressures such as low high-speed rail ticket prices lead to less room for changes in air ticket prices, which weakens the profitability of various airlines. In 2018, the rise in aviation fuel prices led to a precipitous drop in the net profits of airlines. Therefore, it is very important for airlines to control costs in the development process.

### **5.3 Merger and reorganization behaviors promote the continuous enhancement of the operation capacity of civil aviation industry**

After the large-scale merger and reorganization of the civil aviation industry in 2002, the concentration of the civil aviation market has been greatly improved, and the scale of the aviation enterprises has been continuously expanded, which is conducive to the formation of the scale economic effect, the resource integration and the improvement of the utilization rate of resources, the continuous enhancement of the competitive strength and the improvement of the efficiency rate, as well as the optimization and upgrading of the civil aviation industrial structure. Joining the various aviation alliances is beneficial to the complementarity of resources among airlines, which not only brings more convenience to passengers, but also optimizes the allocation of resources, improves the regular passenger load rate and load rate, and enhances the operation capacity.

## **6. Research conclusions and policy recommendations**

### **6.1 Research conclusions**

This paper uses the SCP paradigm to analyze and discuss the market conduct and performance of China's civil aviation industry, and draws the following conclusions.

China's civil aviation industry still has the characteristics of oligopoly structure under government regulation. The pricing of China's civil aviation industry is greatly affected by the difference in cost and regional development, which affects its profitability. Under the background of rapid development of civil aviation industry, service quality keeps improving, but it still needs to be improved. Organizational coordination improves the operation capacity and market competitiveness of civil aviation industry. The market performance of civil aviation industry continues to improve, but the market vitality is still insufficient.

### **6.2 Policy recommendations**

Based on the research conclusions, the following policy recommendations are made.

Transform government functions and create a favorable market competition environment. Relax government regulations and enhance the competitiveness of the civil aviation market. Strengthen infrastructure construction, narrow development gap and promote balanced development of civil aviation industry. Break the administrative monopoly of upstream products in the civil aviation industry and reduce costs.

## **Reference**

- [1] Cao Jinzhou, Dai Changjun. Research on CAAC industry organization based on RPSCP framework [J]. Finance and trade economics, 2009(07):117-122.
- [2] Feng Zhenglin. Promoting high-quality development of civil aviation and ushering in a new journey of building a civil aviation power in a new era [J]. People's forum, 2018(05):6-8.
- [3] He qifu. Analysis on market performance and market structure of China's civil aviation industry [J]. Academic theory, 2010(24):83-87.
- [4] Jia Xiaohui. Research on China's civil aviation freight rate reform from the perspective of marketization [J]. Monthly price, 2018(02):14-17.
- [5] Liu Guangcai, Zhang Qing, Tian Lijun. Analysis on implementation effect and performance of China's civil aviation freight rate reform [J]. Monthly price, 2013(01):21-24.
- [6] Min Zongtao, Yang Xiuyun, Liu Bin. An analysis of industrial organization in the historical evolution of price behavior of Civil Aviation Enterprises [J]. Journal of shanxi university of finance and economics, 2003(03):57-61.
- [7] Su Dongshui. Industrial Economics(The 4th edition) [M]. Beijing: higher education

press,2015:37.

[8] Wang Junhao. Industrial Economics [M]. Beijing: higher education press,2016:5.

[9] Wu Jianwei, Lou Yong, Zhang Xin. Industrial Economics [M]. Beijing: tsinghua university press,2016:18-19.

[10]Wang Yihan. Research on domestic freight rate reform of civil aviation based on marketization [J]. Monthly price,2016(11):22-25.

[11]Wu Wenyu. Market performance analysis of China's civil aviation industry [D]. Shanghai: business school of east China university of science and technology,2014.

[12]Xie Sixing, Hou Meng. Mechanism and empirical analysis of the impact of regulatory reform on the development efficiency of China's civil aviation industry [J]. China science and technology forum,2017(03):64-72.

[13]Xu Xiaohu. SCP, price regulation and reform strategy of China's civil aviation industry [J]. Journal of shanxi university of finance and economics,2001(S1):62-63.

[14]Xiong Yangchun. Analysis on market structure and performance of CAAC [D]. Hunan: business school of hunan normal university,2006.

[15]Yang Gongpi, Xia Dawei. Modern Industrial Economics(The second edition) [M]. Shanghai: Shanghai university of finance and economics press,2005:53+77.

[16]Yin Aizhen, Ma Xiaoli, Yu Peng. M&A performance evaluation based on M&A motivation -- a case study of China Eastern airlines' merger with Shanghai airlines [J]. Journal of finance and accounting,2018(11):107-114.

[17]Yu Liangchun, Yao Li. Analysis of economies of scale and related industrial organization policies in China's civil aviation industry [J]. Industrial economy research,2006(02):18-23+54. (in Chinese)

[18]Zhang Hong. Impact of multi-market exposure on enterprise competitiveness -- empirical analysis from China's civil aviation industry [J]. Economic management,2010(11):41-49.

[19]Zhu Jie, Ren Rongming. Research on the relationship between "going global" and performance of Chinese civil aviation enterprises -- based on empirical data of listed enterprises [J]. Science and technology management research,2015(08):168-173.

[20]Zhong Zhihui. Research on market conduct and performance of China's civil aviation industry [D]. Shanghai: school of economics and management, tongji university,2006.

[21]Zhou Yongyong. Analysis on industrial organization of China's civil aviation industry [D]. Fujian: school of economics, xiamen university,2007.

[22]IATROU K, ORETTI M. Airline choices for the future: from alliances to mergers [J]. International Review of Aerospace Engineering,2009,2(5):286.

[23]JUTTA J, CATHLEEN D. Evidence of changing contestability in commercial airline markets during the 1980s [J].The Journal of Consumer Affairs, 1994,28(1):1-24.