

Comparative Study on the Development of Regional Aviation

Lin Yan

School of Air Transportation, Shanghai University of Engineering Science, China

Abstract: *As an important part of air transportation, regional aviation has the convenience and rapidity that cannot be replaced by other modes of transportation. This paper analyzes the factors affecting the development of regional aviation, compares the development of regional aviation of various region in China by using distribution ratio and potential quotient, and puts forward suggestions that the formulation and planning of future regional aviation development should be based on the actual situation of various region.*

Keywords –regional airlines, regions, comparison

Date of Submission: 08-07-2022

Date of Acceptance: 22-07-2022

I. INTRODUCTION

Since the 21st century, after more than 40 years of reform and opening up, China has become one of the most active countries in the global economy, and has also become the world's largest trading and logistics country, which has provided favorable conditions for the development of China's regional aviation. However, compared with the trunk air transportation, the development of China's regional air transportation lags behind. In 2019, there were 186 regional airports in China, accounting for more than 79% of all airports in China, but the throughput of regional airports reached only 141.14 million people, accounting for only 6.9% of the passenger throughput of all domestic airports. Therefore, in order to promote the economic development of small and medium-sized cities in China and improve the convenience of residents' travel, it is extremely necessary to deeply study China's regional air transport market, analyze and compare the development of regional airlines in different regions, and take measures to improve the regional aviation market.

II. DEVELOPMENT STATUS OF CHINA'S REGIONAL AIR TRANSPORT

Although China has increased its investment in the field of regional aviation in recent years, the number of regional airports is also rising, and many small cities have their own airports, the proportion of the throughput of regional airports is still very low. There is a lack of effective cooperation between trunk and branch transportation, especially between trunk and branch transportation in the same region. 2019 statistics show that the flight density between China's large airports is 4.8 flights a day, while the flight density between regional airports is only 0.75 flights a day. The existing density of feeder routes, whether for business passengers or leisure passengers, can not take into account the return trip within a day, which greatly reduces the convenience and is detrimental to the layout of the aviation network and the long-term benefits of airlines.

III. FACTORS AFFECTING THE DEVELOPMENT OF REGIONAL AIR TRANSPORT

3.1 Economic development level

In modern transportation, the price of air transportation is generally higher than that of other transportation modes, so the development of air transportation is inseparable from the impact of national economic development level and residents' consumption level. The level of local economic development determines the level and characteristics of industrial economic activities and trade activities, which in turn directly affect the growth of business travelers. The level of economic development also affects personal income, which in turn affects leisure travel. The level of economic development is generally measured by the local GDP. The local GDP and its composition and changes have become the key factors affecting regional air transport.

3.2 Population

The object of air passenger transportation is people. Areas with large population have relatively large market demand. Conversely, areas with small population have relatively small market demand. The growth of population, the increase of the proportion of floating population, the increase of population density and so on may mean the increase of air transport passenger demand. Residents' leisure travel needs, such as visiting relatives, friends, tourism, etc., account for a large proportion of the overall market demand. With the increase of population and income level in small and medium-sized cities, the demand for regional air transportation will

also increase.

3.3 Development of tourism

With the improvement of people's living standards, more and more people begin to be interested in tourism. Tourism transportation demand has more potential than ordinary transportation demand. The development of tourism is a powerful driving force for the development of the aviation market, especially the regional aviation market. For regions that are remote and relatively backward in regional economy, when the local economy cannot develop faster at once, developing and utilizing tourism resources to promote the development of the aviation market is an effective way, which not only avoids being constrained by the development speed of the regional economy, but also gives full play to its own advantages.

3.4 Development of other transportation modes

There is substitution between transportation modes, so when considering the demand of the aviation market, we should not only analyze from itself, but also consider the degree of substitution of other transportation modes. In recent years, in addition to the vigorous development of civil aviation in China, high-speed rail and highway transportation modes are also developing. This is unfavorable to the development of regional airlines. First of all, if the time consumption and travel comfort are similar, passengers will naturally prefer the ground transportation mode with relatively low price. Second, most airports are built in areas far away from the city center, and the security measures of airports are more restrictive than ground transportation. The time before taking a ride is longer than that of high-speed rail and cars, so the overall convenience is not as good as ground transportation. Third, China's regional airlines are still in the development stage and are not mature enough. The layout of the aviation network and the coordination of capacity allocation are not very perfect and reasonable. The flight frequency is not comparable to ground transportation, which will also lead to the loss of some passengers.

IV. COMPARISON OF REGIONAL AVIATION DEVELOPMENT IN DIFFERENT REGIONS

Regional airlines usually operate routes with relatively short distance, so they have obvious regional limitations. The regional distribution of China's civil aviation can be divided into seven regions: Northeast China, North China, East China, Central South China, Southwest China, Northwest China and Xinjiang. The development of regional air transport will be analyzed and compared below.

4.1 Analysis indicators

(1) Distribution ratio

Distribution ratio refers to the percentage of a certain element distributed in a sub region. The larger the ratio, the more shares distributed in this region.

(2) potential quotient

Potential quotient refers to the quotient of the distribution ratio of two related indicators.

4.2 Distribution ratio of regional airlines

In order to compare the development of regional air transport in different regions of China, the following formula is used:

Distribution ratio of regional airlines in a certain region = throughput of regional airports in a certain region ÷ throughput of national regional airports × 100%

The distribution ratio of regional airlines from 2017 to 2019 is calculated, and the results are shown in Figure 1.

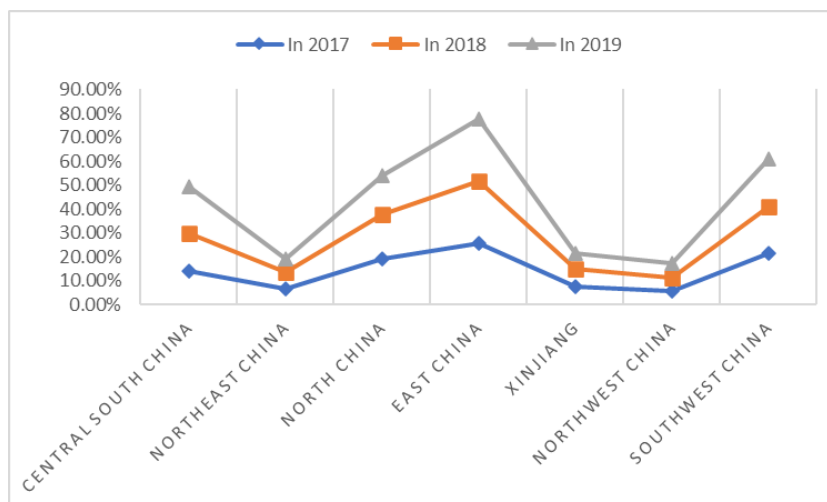


Figure 1 distribution ratio of regional airlines in 2017-2019

It can be seen from Figure 1 that the development of China's regional air transport is uneven in various regions. The development of regional air transport in Central South China, North China, East China and Southwest China is better, while Northeast China, Northwest China and Xinjiang are three regions with a very large area in China, but the development of regional air transport is still very immature, and there is still a very large space for development.

4.3 Comparison of potential quotient of regional airlines

The level of economic development, population, the development of tourism and the development of other means of transportation are the influencing factors of the development of regional aviation, but different regions have their own advantages, disadvantages and characteristics. In order to analyze the impact of these factors on regional air transport in various parts of China, the following uses potential quotient to calculate, analyze and compare.

4.3.1 Potential quotient based on economic development level

According to the formula: distribution ratio of economic development level in a certain place = the value of GDP in a certain region ÷ the value of national GDP × 100%, we can get the distribution ratio of economic development level from 2017 to 2019, and then divide the distribution ratio of regional aviation by the distribution ratio of economic development level, and we can get the potential quotient based on the economic development level, as shown in Table 1.

Table 1 Potential quotient based on economic development level in different regions in 2017-2019

	in2017	in2018	in2019
Central South China	0.52	0.59	0.71
Northeast China	1.05	1.07	1.12
North China	1.45	1.41	1.38
East China	0.68	0.69	0.68
Xinjiang	5.65	5.76	4.53
Northwest China	1.36	1.31	1.41
Southwest China	2.08	1.87	1.75

From table 1, it can be seen that from 2017 to 2019, the potential quotient values in Central South China and East China were all below 1.0, indicating that economic development level had a low impact on the development of regional aviation transportation in these two regions. The potential quotient of the other five regions were above 1.0, indicating that economic development level has a high impact on the development of regional aviation in these five regions. Among them, Xinjiang was the most affected region in 2019, and East China was the least affected region.

4.3.2 Potential quotient based on population

According to the formula: population distribution ratio in a certain region = population in a certain region ÷ population in the whole country × 100%, we can get the population distribution ratio from 2017 to 2019, and then divide the distribution ratio of regional aviation by the population distribution ratio, we can get the potential quotient based on the population, as shown in Table 2.

Table 2 Potential quotient based on population in different regions in 2017-2019

	in 2017	in 2018	in 2019
Central South China	0.49	0.56	0.69
Northeast China	0.86	0.85	0.74
North China	1.52	1.46	1.33
East China	0.87	0.88	0.88
Xinjiang	4.13	4.31	3.47
Northwest China	1.02	1.01	1.06
Southwest China	1.49	1.35	1.37

From table 2, it can be seen that from 2017 to 2019, the potential quotient values in Central South China, Northeast China and East China were all below 1.0, indicating that the population had a relatively low impact on the development of regional aviation transportation in these three regions. The potential quotient of the other four regions were above 1.0, indicating that the population had a high impact on the development of regional aviation in these four regions. Among them, Xinjiang was the most affected region in 2019, and Central South China was the least affected region.

4.3.3 Potential quotient based on tourism development

This paper uses tourism income to reflect the level of tourism development. According to the formula: tourism development distribution ratio in a certain region = tourism revenue in a certain region ÷ national tourism revenue × 100%, we can get the tourism development distribution ratio from 2017 to 2019, and then divide the distribution ratio of regional aviation by the tourism development distribution ratio, we can get the potential quotient based on tourism development, as shown in Table 3.

Table 3 Potential quotient based on tourism development in different regions in 2017-2019

	in 2017	in 2018	in 2019
Central South China	0.58	0.68	0.81
Northeast China	1.06	1.05	0.90
North China	1.27	1.24	1.32
East China	0.82	0.82	0.79
Xinjiang	6.6	5.77	4.46
Northwest China	1.29	1.20	1.20
Southwest China	1.30	1.11	1.04

From table 3, it can be seen that from 2017 to 2019, the potential quotient values in Central South China and East China were below 1.0, indicating that the development of tourism had a small impact on the development of regional aviation transportation in these two regions. The potential quotient of the other five regions were above or close to 1.0, indicating that the development of tourism had a high impact on the development of regional aviation in these five regions. Among them, Xinjiang was the most affected region in 2019, and East China was the least affected region.

4.3.4 Potential quotient based on development of other transportation modes

Among other transportation modes, railways and highways will have an impact on regional aviation transportation. This paper uses the sum of railway passenger volume and highway passenger volume to reflect the development of other transportation modes.

According to the formula: distribution ratio of development of other transportation modes in a certain region = railway and road passenger volume in a certain region ÷ national railway and road passenger volume × 100%, we can get the distribution ratio of development of other transportation modes from 2017 to 2019, and then divide the distribution ratio of regional aviation by the distribution ratio of development of other transportation modes, we can get the potential quotient based on development of other transportation modes, as shown in Table 4.

Table 4 Potential quotient based on development of other transportation modes in different regions in 2017-2019

	in 2017	in 2018	in 2019
Central South China	0.43	0.54	0.66
Northeast China	0.79	0.85	0.73
North China	1.88	1.98	1.74
East China	0.99	0.97	0.94
Xinjiang	4.36	6.25	5.14
Northwest China	0.75	0.66	0.79
Southwest China	1.56	1.17	1.19

From table 4, it can be seen that from 2017 to 2019, the potential quotient values in Central South China, Northeast China, East China and Northwest China were below 1.0, indicating that the development of railways and highways in these four regions were good, and the development of regional aviation in these four regions was greatly restricted. While the potential quotient of the other three regions was above 1.0, indicating that the development of railway and highway in these three regions was relatively slow, and the development of regional aviation in these three regions was less restricted by it. Among them, in 2019, Xinjiang was the least restricted and Central South China was the most restricted.

V. CONCLUSION

As an important force in air transportation, the development of regional aviation is very important. It plays a vital role in China's economic construction, basic transportation construction and domestic social system. However, it can be seen from the above analysis that the development of regional aviation in China is uneven, and the factors affecting the development of regional aviation have different effects on different regions. Therefore, China needs to formulate different measures according to local conditions and the characteristics of local economy, population and society. At the same time, we should pay attention to the adjustment of regional routes and fleet structure, and gradually transition to a more reasonable regional aviation structure.

REFERENCES

- [1]. Li Fei, song Yixin, Zhang Quan. Current situation analysis and countermeasure research of feeder airports in China. Transportation research, 2018,4 (04): 61-68.
- [2]. Liu Jing, Zhu Zhiyu, Ren Zhiqiang, Li Tao. Analysis on the relationship between passenger throughput of regional airports in Southwest China and regional GDP. Technology and industry, 2020,20 (04): 93-97.
- [3]. Zhang Keyi, junuo, Huang Ruiqi. Research on the relationship between Regional Airport throughput and regional economic development level. Air transportation business, 2021 (11): 6-11.
- [4]. Zhang Xiaoyan, Xiao Wenjin, Zhang Huijuan. Growth classification of regional airports based on business volume development characteristics. Comprehensive transportation, 2021,43 (12): 39-44.
- [5]. Yang Zheng. Research on the current situation and development trend of regional air transportation. China high tech Zone, 2017 (18): 223-224.

Lin Yan. "Comparative Study on the Development of Regional Aviation." *IOSR Journal of Business and Management (IOSR-JBM)*, 24(07), 2022, pp. 30-34.