Airport Economic Development Stage and Industrial Distribution in Zhengzhou City

Li-xue LIU
School of Economics and Management, Beijing Jiaotong University, Beijing, China
hngkllx@126.com

Keywords: Airport Economy, Airport Industry, Development Stage.

Abstract. Combined with regular feature of development stage, the work derived that airport economy was at growth stage by analyzing its development situation in Zhengzhou according to airport transportation scale and industrial structure. Based on this, the work proposed industrial structure adjustment modes including productive service supporting mode and airport high-tech industry chain absorption mode.

Introduction

In the era of economic globalization, networking and informatization, the airport, especially the international airport, has become the engine driving the development of regional economy. By attracting relevant industrial agglomeration, airport and its surrounding area has evolved into airport economic zone—a region with highly-concentrated characteristic economy activities. Airport economy is becoming the dominant mode of global economic development. As the provincial capital of Henan Province, Zhengzhou is the central city of central China economic zone connecting south and north, as well as east and west. As one of railway, highway and airport hubs in China, Henan is richly endowed by nature to develop airport economy. In 2013, the State Council officially approved the Zhengzhou Airport to become the Comprehensive Experimental Zone for National Aviation [1]. It indicates that China has brought Zhengzhou airport economic development into the national strategy. At present, construction of Zhengzhou airport economic zone has problems including systematic exploration of industrial distribution, economic effect and development path of airport economic zone. The problems are solved by combining social economy development in Henan Province with development characteristics of Zhengzhou Airport Economic Zone. Therefore, the work explored Zhengzhou airport economic development stage at present by analyzing stage characteristics of airport economic development at home and abroad. After that, the work proposed the suggestions for airport industrial distribution.

Law of Airport Economic Development Stage

Periodicity of airport economic development

Scholars have discussed the periodicity of airport economic development. Cao Yunchun divided airport economy into formation, growth and mature stages. In formation stage, the driving force of airport plays a leading role. In growth stage, airport preference enterprises aggregate around the airport because of airport polarization. In mature stage, complete industry and value chains are formed. Innovation mechanism and regional innovation system have become important factors to develop airport economy [2]. Yang Youxiao et al. divided airport economy into preparation, growth, mature, stagnating and aviation city development stages [3]. With similar opinion, Zhao Wen divided airport economy into initial, rapid development and mature stages. At initial stage, airport industry consists of Aviation service and aviation manufacturing. At rapid development stage, aviation hub oriented industry in manufacturing with high added value is rapidly developed. At mature stage, modern service and culture industries will be dominant in airport economic zone [4]. Wang Xiaoyong
divided airport economy into transportation economy, industrial agglomeration and city economy stages. Different scholars have different expressions and priorities to airport economic develop stage [5]. However, the internal logic is basically the same. Table 1 shows development stage and characteristics of airport economy.

Table 1. Development stage and characteristics of airport economy.

<table>
<thead>
<tr>
<th>Development Stage</th>
<th>Development Target</th>
<th>Transportation Scale</th>
<th>Leading Industry</th>
<th>Type of Airport Economic Zone</th>
</tr>
</thead>
<tbody>
<tr>
<td>Formation Stage</td>
<td>Ensure airport operation to satisfy airport development</td>
<td>Small</td>
<td>Air Transport and Aircraft Equipment Manufacturing</td>
<td>Aviation Hub</td>
</tr>
<tr>
<td>Growth Stage</td>
<td>Service airport industry to drive its development</td>
<td>Rapid Development (Freight &gt; Passenger Transport)</td>
<td>Manufacturing Industry and Productive Service with High Added Value</td>
<td>Industrial Park</td>
</tr>
<tr>
<td>Mature Stage</td>
<td>Service city economy to realize matching of port and city</td>
<td>Large and Stable</td>
<td>Business, Tourism and Cultural Industries</td>
<td>Aviation City</td>
</tr>
</tbody>
</table>

**Influence factors of airport economic development stage**

In evolution process from formation to mature stage, airport economy presents different characteristics. In these stages, airport economy develops in a certain order to present common characteristic because of its development or promotion of external forces. However, the order is not absolute. Many problems result in stagnation of airport economic development. In addition, some airport economy will not reach advanced stage. The evolution of the airport economy to a higher stage is largely affected by factors including airport facility resources and regional economic and social environment. Airport economy in some district will stay in certain stage for a long time [6,7].

1. **Airport polarization**

   The essential reason for formation and development of airport economy is that airport has become the “growth pole” of the regional economy. In different development stages, airport has different polarizations. In formation stage, airport polarization is mainly reflected in putting forward service requirements, with the improvement of aviation infrastructures. Air transport requires multiple industries to provide supporting services including terminal service, aircraft maintenance, aircraft materials, ground transportation, ground service, passenger catering, luggage transport and freight agent. Besides, hotels, restaurants and retailing also provide services for airport staffs and passengers.

   In growth stage, airport facility resources are improved to promote passenger and freight services. Airport polarization is reflected in producing strong correlation effect to air transport oriented industries. Production factors including labor, capital and technology are absorbed to form industrial agglomeration in surrounding area of airport, thus promoting economic development of surrounding area.

   In mature stage, airport infrastructure resources are improved to integrate air transport with regional economy, thus forming large busy airport. Airport polarization is reflected in attracting and driving agglomeration of industries including real estate, culture leisure and tourism. The airport economic zone has become a new metropolitan area.

2. **Supporting of regional economy**
Airport economic development requires economic and social support of local city and region. Economic and spatial scales provide more support and greater development space for airport economic development. In formation stage of airport economy, airport functions are weakly integrated with regional economy, thus causing weak contribution to regional economy. In growth stage, the correlation of airport and airport industry is enhanced. The airport area is required to provide support for land, capital, manpower and raw materials. Besides, airport industry distribution should be scientifically planned to ensure entrance of industries with strong directivity to airport economic zone, achieving optimal allocation and effective utilization of resources. In mature stage, coupling effect of airport economy and regional economic development is more remarkable. The port and the city are integrated with each other to promote economic development. As the hinterland of the airport, regional economy has an important effect to airport economy. The developed hinterland economy is propitious to airport economic development.

Positioning of Airport Economic Development Stage in Zhengzhou

Present situation of airport economic development

Zhengzhou Xinzheng International Airport is the air gateway of Henan province and the important aviation port in China. With airline throughout East, West, South and North China, it is an air traffic hub in central China, undertaking most air transport tasks of Henan Province. Its transportation scale is over 96% of civil aviation of the whole province. Airport renovation and expansion project was completed by the end of 2007. Terminal building area is 128,000 square meters; tarmac area 256,000 square meters; aircraft seats are 43. In 2008, Zhengzhou Xinzheng International Airport has the second largest passenger transport increment and the largest freight increment among ten largest airports in China. In 2014, Zhengzhou Xinzheng International Airport completed cargo throughput of 370,000 tons, with a growth rate of 44.9% over last year. In addition, passenger throughput reached 15.805 million, with a growth rate of 20.3% (as shown in Fig. 1).

At present, Zhengzhou Airport Economy Zone built based on national planning has an area of 415km². It consists of Zhengzhou Airport, Comprehensive Bonded Zone and surrounding industrial park, covering parts of Zhongmu, Xinzheng, Weishi counties. With total planning area of 138km², Zhengzhou Airport Economy Zone has airport core area (48km²), northern logistics business district (16km²) and southern airport industrial zone (26km²). There are Zhengzhou Xinzheng International Airport, Foxconn, Taiwan, Xuedian and Haoxiangni industrial parks within the airport. In recent years, Xinzheng Airport Zone has determined planning layout of “one city with five zones” including Aviation City, Airport Core Area, Electronic Information Industrial Park, Biomedical Industrial Park, Airport Logistics Park and International Business Community. Besides, Xinzheng Airport Zone has
promoted the construction of new urbanization, the modern industrial system and grid management service. Xinzheng Airport Zone seized the opportunity of the domestic electronic information industry transfer. As a fulcrum to promote aviation economic development, Foxconn project is introduced to produce obvious agglomeration driven effect. The world’s largest smart phone production base built in 2012 remarkably simulates the growth of electrical industry and processing trade export. Therefore, Foxconn supporting and other electronic information enterprises are established.

**Rapid development stage of Zhengzhou airport economy**

Scholars pointed out that airport economy in China is still in growth stage, although with rapid development speed. Airport economy is in late growth stage in national hub airport sites of Beijing, Shanghai and Guangzhou. Airport economy is in early growth stage in regional hub airport sites including Chengdu, Wuhan, Xi’an and Zhengzhou. However, airport economies of different cities present different characteristics because of regional difference of social development. The work analyzed the characteristics of Zhengzhou airport economic development based on air transport throughput and industrial structure.

Table 2 shows the change trend of passenger throughputs in Xinzheng and Capital international airports in recent years. In Table 2, passenger throughput in Capital International Airport is steady. Passenger throughput in Xinzheng International Airport maintains a rapid growth rate. In the future, the transport scale of Xinzheng International Airport cannot reach the level of Capital International Airport. However, Zhengzhou airport economy still has large development space. In Xinzheng International Airport, cargo throughput has larger growth speed than passenger throughput. Combined with characteristics of airport economic development stage in Table 1, it is obvious that Zhengzhou airport economy is in growth development stage.

Table 2. Comparative passenger throughputs of Xinzheng and Capital international airports.

<table>
<thead>
<tr>
<th>Year</th>
<th>Xinzheng International Airport</th>
<th>Capital International Airport</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Passenger (10^4)</td>
<td>Growth Speed (%)</td>
</tr>
<tr>
<td>2012</td>
<td>1167.4</td>
<td>15.0</td>
</tr>
<tr>
<td>2013</td>
<td>1314.0</td>
<td>12.6</td>
</tr>
<tr>
<td>2014</td>
<td>1580.5</td>
<td>20.3</td>
</tr>
</tbody>
</table>

Beijing airport economic development experience shows that Capital Airport has a passenger throughput of over 20 million people in 2000. Beijing begins to plan and construct airport industrial park. Aviation and airport high-tech industries are mainly in Airport Economic Development Zone and Tianzhu Free Trade Zone on the west of Capital Airport. Automobile manufacturing, CNC machines, micro electronics and other modern manufacturing industries are in Beijing Automobile Production Base and Linhe Economic Development Zone on the east. Aviation logistics industry is mainly in Airport Logistics Base on the north. Modern service industries including financial insurance, aviation headquarter economy and tourism exhibition and are mainly in Guomen Business Zone on the south. Taking advantage of airport cargo capacity, Zhengzhou should develop airport industries. Industrial park should be scientifically planned to form aggregation of industries with high added values, thus promoting regional economic growth. Government should formulate related policy according to this advantage.

Secondly, industrial structures of Beijing and Zhengzhou are compared to derive the following result. In recent years, industrial structure of Beijing is mainly the third industry. However, industrial structure of Zhengzhou is the second industry. Airport industrial distribution is affected by the characteristics of urban industrial structures. At present, airport industrial development emphasizes high-end services. e.g., Guomen Business Zone on the south of Capital International Airport focuses on the development of head quarter business, hotel apartment, high technology, aviation and business service. Matching service industries consist of commercial, catering, real estate, culture,
According to actual situation of second industry, Zhengzhou airport economy develops airport-oriented manufacturing with high added value and related productive service industries.

### Table 3. Comparative industrial structures Zhengzhou and Beijing.

<table>
<thead>
<tr>
<th>Year</th>
<th>Zhengzhou City</th>
<th>Beijing City</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Added Value of Second Industry (100 million Yuan)</td>
<td>Rate (%)</td>
</tr>
<tr>
<td>2012</td>
<td>3208.4</td>
<td>57.8</td>
</tr>
<tr>
<td>2013</td>
<td>3470.5</td>
<td>56.0</td>
</tr>
<tr>
<td>2014</td>
<td>3771.1</td>
<td>55.6</td>
</tr>
</tbody>
</table>

### Suggestions of Airport Industrial Distribution in Zhengzhou

**Establishing airport high-tech industrial chain**

Airport high-tech industrial chain is established by taking manufacturing sector of Zhengzhou airport zone as the core. The internal connection force is the chain link formed by logical and time-space distribution relations among enterprises. Upstream and downstream enterprises are absorbed to form complete mode of manufacturing chain in airport economic zone.

From the perspective of industrial environment, various industries are correlative, different and interdependent. The existence of an industry becomes the premise or result of another industry development. Each industry is one link or fragment of industrial system. These links or fragments have inherent requirement for integration.

From the perspective of competition, competitive advantages of modern enterprises are beyond the capability and resource of a single enterprise. The competition ranges from individual enterprise to industrial chain competition. More and more competitive advantages are derived from system coordination between enterprise and links in industrial value chain. Therefore, competitive advantages should be established based on larger and more industrial resources and core abilities.

From the perspective of higher level, competitions of modern regions or enterprises are between industrial chains. Therefore, airport enterprises requires “link”. Chain formation is objectively formed according to technical, economic association, logical and time-space distribution relations. This formation is used to ensure that the overall advantage of enterprise is transformed into that of region and industry, thus forming core competence.

In growth stage of airport economy, Zhengzhou should develop advanced manufacturing industries with high airport directivity including high-end equipment manufacturing, new generation information technology and biomedicine. More complete manufacturing industry chain is established by absorbing upstream and downstream supply chain enterprises. These enterprises provide key manufacturing enterprises with reliable and continuous supply of raw materials and components, thus strengthening competitive advantage of advanced manufacturing industry.

**Improving supporting level of productive service industry**

Productive service industry provides services for production and business activities rather than individual consumers. It is the intermediate input service for further production of goods and services. With professionalism, innovation and intellectuality, productivity service industry consists of finance, insurance, law, accounting, management consulting, R&D, engineering design, product sales, maintenance, transportation, communication, advertising, logistics and warehousing.

Supporting level of productive service industry should be improved. After reaching a certain scale, manufacturing requires more excellent services of design, finance, intermediary, sales and transportation in production process. Therefore, we should create better environmental conditions for
industrial development of airport economic zone by largely developing modern manufacturing and productive service industry with airport directivity.

Cooperative supporting of productive service industry is an important method of reducing transaction cost and improving production efficiency based on production scale expansion of manufacturing in airport economic zone. With the reform of production organization mode and professional specialization, manufacturing enterprises tend to decompose value chain based on own core competence. The enterprises outsource some supporting and basic activities including human resources, accounting, R&D, design, procurement, transportation, warehousing and after-sales service. These outsourced businesses gradually form independent industry providing professional service. With improvement of service level and work decomposition, the cost decreases to release scale economy and learning effects, promoting business externalization of enterprises and development of productive service industry.

In growth stage of airport economy, Zhengzhou Airport Economy Zone largely develops knowledge-intensive, specialty-intensive and high value-added modern service industries including electronic commerce, aviation logistics and internet banking. Based on this, industrial structure of airport economic zone is upgraded to achieve maximum of production benefit.

References


