

Analysis of Countermeasures for the Development of Zhengzhou Aviation Hub Economy Industry

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Abstract: Taking Zhengzhou aviation port as an example, the analysis is conducted from the perspective of the aviation hub economy. The industrial development and layout pattern of the aviation hub economy are first introduced, and then the industrial development foundation, as well as the industrial structure of Zhengzhou, are analyzed. The analysis summarizes the opportunities for the industrial development of Zhengzhou's aviation hub economy, such as the Air Silk Road and Zhengzhou Free Trade Zone, and summarizes 25 alternative industries in combination with Zhengzhou's industrial policy guidance. Among the alternative industries, industrial selection criteria are established in four aspects: industrial prospect (industrial efficiency, driving ability), own conditions (industrial foundation, scientific research advantages), external conditions (industrial policy, market demand), and aviation relevance (product added value, speed requirements), and the scores of each index of each industry are quantified by expert scoring method to select key industry types and put forward relevant development suggestions.

Keywords: hub economy; Zhengzhou aviation hub; industry evaluation index; industry system

1. Introduction

In 1959, the Shannon International Airport Free Trade Zone was established in Ireland to build an economic zone around the aviation hub, which is the prototype of the aviation hub economy¹, CangRongwei and SunXiaojia mentioned in the article. 2004, the Capital Airport held the "Beijing Shunyi 2004 Airside Economic Development Forum", which kicked off the development of China's aviation hub economy. 2013 On March 7, 2013, the State Council of the People's Republic of China approved the "Development Plan of Zhengzhou Airport Economic Comprehensive Experimental Zone (2013-2025)", and Zhengzhou Airport Economic Comprehensive Experimental Zone was established. Guo Lili mentioned in the article ,Zhengzhou Aerodrome Economic Comprehensive Experimental Zone is the first aviation economic pilot zone in China that has been upgraded to a national strategy and is currently the only one approved by the State Council². The development of an aviation hub economy in Zhengzhou will provide a development experience for other airside economic demonstration zones in China, and at the same time drive the urban economic development of

Zhengzhou. Based on the special characteristics of aviation-related industries, Zhengzhou Airport and Zhengzhou Aerodrome Economic Comprehensive Experimental Zone will play a key role in optimizing Zhengzhou's industrial structure, so the design of a good industrial system is especially crucial to the development of Zhengzhou's aviation hub economy.

In the article, Reflections on the industrial system with the development of the hub economy as the core in the high-speed rail area, Xuan Lei and Yang Chunling mentioned, at present, the analysis methods for industrial system construction are relatively mature, generally using hierarchical analysis, principal component analysis, and expert scoring methods for industry selection³. Different from the selection of general economic system indicators, for the aviation hub economy, industry selection should consider the suitability of the industry itself and aviation. In this paper, we will firstly screen and summarize the industries through industrial advantages, industrial foundation, and industrial opportunities, and then construct an industrial screening model, establish indicators through hierarchical analysis, combine them with the expert scoring method, and finally determine the industrial system. The research in this paper will take Zhengzhou Airport Area as an example to build industrial system indicators and explore the research on developing the aviation hub economy in Zhengzhou.

2. Economic analysis of airline hubs

2.1 Airline hub economic development law

Large hub airports have a significant economic and social impact on the surrounding area, such as attracting industry, increasing tax revenue, and resolving employment issues. With the trend of diversification and flexibility in market demand, time is increasingly showing its unique role, and efficiency and flexibility have become the primary considerations for business enterprises. Based on the fast and efficient transportation characteristics of air transportation, which can meet such requirements for efficiency, flexibility, and reliability, the highly time-sensitive industries gradually gather around the airport, high-tech and IT enterprises, exhibition centers and multinational companies' headquarters appear in large numbers around the airport, and stimulate the further expansion of air cargo and air express, and produce a greater attraction to freight forwarders and third-party logistics providers. The aviation logistics park is born. The aviation hub economy is a phenomenon and model that relies on air transportation to realize the concentration of economic factors in space, and then realize the diffusion, thus driving the regional economic development.

In 1992, Professor Casada of the University of North Carolina put forward the "fifth wave theory", believing that air transportation is the fifth shock wave for regional economic development after shipping, natural canal, railroad, and road transportation, and is an important support for the rapid rise of modern international economic center cities. Beijing Capital Airport in Shunyi District has formed a complete industrial system of the aviation service industry, port trade industry, and business exhibition industry, while actively expanding technology services, emerging finance, and cultural tourism to create a "3+3" high-end aviation hub economic industrial system. After years of development, the Capital Airport Economic Demonstration Zone has now gathered more than 400 aviation enterprises, including the three major centers and five major groups of China's civil aviation, and two-thirds of the total number of enterprises directly related to aviation industry in Beijing.

In addition, the study found that the industrial development of the aviation hub area has obvious circle characteristics, the first circle is within 1km around the airport, where the airport is located, including the airport infrastructure and industries related to the airport operation, such as aircraft logistics services, passenger services, air cargo services, etc., as well as the offices of airlines, which are functional areas directly serving all aspects of the airport; the second circle usually refers to The second sphere is usually within 1km-3km of the airport, and the industries adjacent to the airport area have a high airside orientation and are the main place of economic activities of the airport, mainly distributed with aviation core industries and aviation-related industries, mainly laid out in industrial parks, airport logistics parks and export processing zones, etc.; the third sphere is within 3km-10km of the airport, or within 15 minutes of the airport transportation corridor. The third circle is within 3km-10km around the airport, or 15 minutes along the airport transportation corridor, mainly distributed with some aviation-related industries and aviation-induced industries, developing airline headquarters, financial and insurance institutions and high-tech industries, exhibition centers, multinational headquarters, etc.; the outermost circle is usually within a 30-minute drive around the airport, in which the influence of the aviation hub will gradually diminish and the industries have diversified characteristics, Jiang Yushi, Zhang Praseodymium and Li Jiang mentioned in the article, Study on the Coupling of Industrial System and Spatial System in the Airliner Economic Zone.

2.2 Aviation hub industry development foundation

2.2.1 Foundation of industrial development in Zhengzhou

The overall economic development level of Zhengzhou City is far ahead of Henan Province, with strong economic strength. By further improving its industrial system, Zhengzhou will be fully capable of driving the industrial development of neighboring cities.

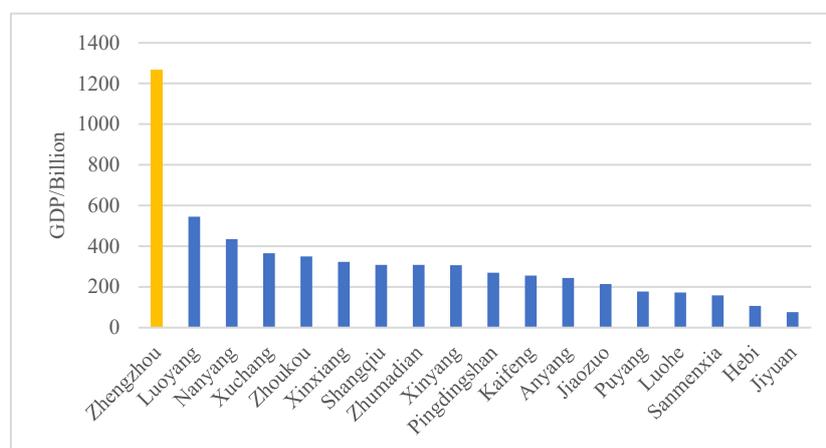


Figure 1 GDP ranking by the city in Henan Province, 2021

2.2.2 Industrial Structure of Zhengzhou City

At present, Zhengzhou's industrial development is dominated by the secondary and tertiary industries, forming six leading industries of electronic information, automobile and equipment

manufacturing, modern food, new materials, aluminum processing products, and biomedical industry, with a strong manufacturing base, but the industrial chain is not perfect and the intelligence is low. After comparing with Taiyuan, Hefei, Wuhan, Changsha, and Nanchang, it is found that Zhengzhou ranks last among the six provincial capitals in central China in terms of comprehensive efficiency value of the tertiary industry, which indicates that Zhengzhou's tertiary industry has no advantage in the competition with other provincial capitals. Zhengzhou should make use of its advantages and give full play to the scientific research advantages of 68 universities to empower its industrial transformation and upgrade and develop the science and innovation R&D service industry.

2.3 Aviation hub economic development opportunities

2.3.1 Seize the development opportunity of "four roads" synergy

The Civil Aviation Administration and the National Development and Reform Commission jointly issued the "Implementation Plan for Promoting the High-Quality Development of the Air Silk Road" during the "14th Five-Year Plan" period in May 2022. Since the "Air Silk Road" was proposed in 2017, Zhengzhou City has taken the lead in the construction of the Zhengzhou-Luxembourg "Air Silk Road", driven the "Online Silk Road" and "Land Silk Road", and docked the "Maritime Silk Road", forming a synergistic opening pattern of the "four roads".

2.3.2 Zhengzhou Free Trade Zone Industry Development Opportunities

In March 2013, the State Council approved the Development Plan of Zhengzhou Aerodrome Economic Comprehensive Experimental Zone (2013-2025), and the country's first airside economic demonstration zone officially set sail. 2021, March 1, the Zhengzhou Aerodrome Economic Comprehensive Experimental Zone Regulations promulgated by the Henan Provincial People's Congress officially came into effect, and the development of Zhengzhou Aerodrome Economic Comprehensive Experimental Zone ushered in a new opportunity while attracting more aviation-related industries to locate around the airport. In 2021, the Shunfeng Shi Shufang mentioned Zhengzhou Air Express Forwarding Center was officially opened at Zhengzhou Airport, which effectively improves the efficiency of Shunfeng's air express processing and distribution efficiency in Henan Province, and Zhengzhou will gradually become a regional air forwarding hub for Shunfeng nationwide, and the pattern of multiple cargo stations at Zhengzhou Airport will be expanded again⁵.

2.3.3 Zhengzhou City Industrial Policy Orientation

Henan Provincial People's Government issued the "Henan Province" 14 Five "aviation economic development plan", "planning" in the aviation industry, aviation equipment manufacturing and maintenance, electronic information, biomedical, and other high-end aviation manufacturing industry to accelerate the development of the formation of 3-5 aviation high-end manufacturing clusters, the main business income of more than 1 trillion yuan. The main business income exceeds 1 trillion yuan. Cultivate 3-5 nationally renowned aviation manufacturing and maintenance enterprises. Aircraft leasing, commercial factoring, and other aviation finance industry to achieve breakthroughs, aircraft leasing business volume in the forefront of the country.

3. Hub economy industrial system construction

3.1 Aviation hub economic industry selection

From the basis of industrial development, industrial development advantages, development opportunities, and other aspects, combined with the results of the industrial policy of the planning of industry types combined summary, can be derived from 25 alternative industries, respectively: intelligent equipment, cloud computing (software), integrated circuits, emerging finance, new display, new energy vehicles, new infrastructure, Internet of things, cultural tourism, biomedicine, trade and exhibition, cross-border e-commerce, port trade industry, technology services, robotics, aviation logistics, aviation services, aviation finance, electronic information, big data, semiconductors, automotive networking, digital economy, aviation training, aviation maintenance.

Based on 25 alternative industries, the selection index criteria as well as the evaluation basis (see Figure 2) were established from 4 aspects, such as industrial prospect (industrial efficiency, driving ability), own conditions (industrial foundation, scientific research advantages), external conditions (industrial policy, market demand), aviation relevance (added value of products, speed requirements), etc. Based on the scoring results(see Figure 3), the key industries for the development of the aviation hub economy in Zhengzhou were finally determined as follows: electronic information, trade, and exhibition, new energy automobile, biomedicine, semiconductor, new display, intelligent equipment, new infrastructure, aviation logistics, cross-border e-commerce.

comparison type		Excellent (1 Score)	Common (0.5 Score)	Poor (0 Score)
Industry Prospects	Industry Benefits	High value-added industry, which can largely promote the upgrading of the industrial system	The added value of the product is general, and it has a certain promotion effect on the upgrading of the industrial system	The low added value of products and little promotion of industrial system upgrading
	Leading ability	Long industry chain, able to attract industry chain clusters and drive the development of related industries	Longer industry chain, with a driving effect on related industries	Short industrial chain, the poor driving ability of related industries
Own conditions	Industrial Base	Strong industrial base around the aviation hub	There is a certain industrial base around the aviation hub	No industrial base around the aviation hub
	Research Advantages	A large number of universities and research institutes, rich	There are some universities and research institutes with general	The low number of universities and research institutes, lack of

Business Exhibition	1	1	1	1	1	1	1	1	8
Cross-border e-commerce	1	1	1	1	1	1	1	1	8
Port Trade Industry	0.5	1	1	0	0.5	0.5	1	0.5	5
Technology Services	1	0.5	0.5	0.5	0.5	0.5	0.5	0	4
Robotics	1	0.5	0.5	0.5	0.5	0.5	1	0	4.5
Air Logistics	1	1	1	1	1	1	1	1	8
Aviation Services	0.5	0.5	0.5	0	0.5	0.5	1	0.5	4
Aviation Finance	1	0.5	0.5	0	1	0.5	0.5	0	4
Electronic Information	1	1	1	1	1	1	1	1	8
Big Data	0.5	1	0.5	0.5	0.5	1	0.5	0	4.5
Semiconductors	1	1	1	1	1	1	1	1	8
Telematics	0.5	1	0.5	0.5	1	0.5	1	0	5
Digital Economy	0.5	1	0.5	0.5	1	1	0.5	0	5
Aviation Training	1	0.5	0.5	0	1	0.5	0.5	0	4
Aviation Maintenance	1	0.5	0.5	0.5	0.5	0.5	0.5	1	5

Figure 3 Table of specific scores for each industry

3.2 Measures for the economic development of Zhengzhou aviation hub

From the air transport support industry development to the industrial chain, supply chain synergy organization as the characteristics of the aviation and industrial integration development change. For a long time, aviation logistics as supporting support for industrial development, and the synergy and integration of the two is not enough, Zhengzhou aviation hub industrial structure is single, small scale, low level, with the same function, the industry chain upstream and downstream expansion and drive is not enough. Through the industrial organization mode of laying out the supply chain around the industrial chain and enhancing the value chain around the supply chain, and taking the aviation hub economic bearing platform as the fulcrum, we can promote the mutual development of transportation organization, logistics organization, supply chain management, and industrial organization, and form an industrial operation mode that is compatible with the modern industrial system. Focus on improving the core industry competitiveness of the hub economy such as logistics, trade, and circulation, vigorously develop the airport service hub economy, create several high-end manufacturing and production service industry chains with scale advantages and competitive advantages of the hub preference, to accelerate the formation of modern hub industrial system.

4. Conclusion

According to the development idea of "combining long and short term, attracting and nurturing", combined with the industrial layout law around Zhengzhou aviation hub, we plan to implement two 100 billion industry clusters of electronic information and business exhibition, and eight 10 billion industry clusters of new energy automobile, biomedicine, semiconductor, new-type display, intelligent equipment, new infrastructure, aviation logistics, cross-border e-commerce, etc. clusters. Accelerate the development of new energy automobile and new infrastructure industries to form new 100 billion industry clusters.

This paper takes the development of the aviation hub economy as the starting point, considers the industry's conditions, the basic conditions of Zhengzhou aviation hub itself, the external environment and the characteristics of air transportation, and identifies the industries that are suitable for Zhengzhou's industrial base, have development prospects, are in line with Zhengzhou's industrial development policy guidance and have a high degree of correlation with air transportation, and then puts forward relevant suggestions for the development of Zhengzhou's aviation hub economy.

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