

Evaluation System for High Quality Development of Daxing International Airport Economic Zone

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Abstract

As one of the core contents of the “Two Districts Construction” in Beijing, the Daxing International Airport Economic Zone is a high-end service industry element gathering area that integrates free trade zone, comprehensive demonstration zone for expanding and opening of the service industry, and digital demonstration zone. This article takes the Daxing International Airport Economic Zone as an example to explore the high-quality development evaluation model system for the construction of the two districts in Beijing, which has significant practical significance. Starting from theoretical, academic, and practical foundations, this article constructs a high-quality development evaluation model for the airport economic zone of Daxing International Airport, and selects the model based on expert argumentation results to determine the final evaluation model system, ensuring the theoretical, academic, practical, and scientific nature of the evaluation model construction.

Keywords

Daxing International Airport Economic Zone, High-Quality Development, Indicator System

1. Introduction

The Daxing Airport Economic Zone is in the core location of the joint development of Beijing-Tianjin-Hebei. It assumes a major mission of the new power source of the country's development, which has an international super-large comprehensive hub, and is the only national level airport economic demonstration zone, dual free trade zone, comprehensive protection zone, service industry

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expansion and opening comprehensive demonstration zone, Zhongguancun independent innovation demonstration zone, and digital trade pilot zone in China, as well as the economic functional zone that integrates the advantages of the trade digitization demonstration zone being applied for, it is one of the important contents of Beijing's "two zones" construction.

On July 30, 2015, the Beijing Daxing International Airport project was officially approved by the Central Political Bureau. According to the "Beijing Daxing International Airport Economic Zone Plan (2016-2020)" approved by the State Council, the total land use scale of the airport economic zone is about 150 square kilometers, including about 50 square kilometers in Beijing and 100 square kilometers in Hebei. Strategically positioned as an international communication center functional carrying area, a national aviation technology innovation leading area, and a Beijing Tianjin Hebei coordinated development demonstration area. Combining the relaxation of Beijing's non-capital functions and the upgrading of regional industrial structure, we will focus on developing the aviation logistics industry and comprehensive bonded zones, appropriately undertake the transfer of Beijing's non-capital functions, orderly develop knowledge intensive and capital intensive high-end service industries such as technology research and development, cross-border e-commerce, and financial services, and create an international, high-end, and service-oriented airport economic zone.

This article takes the Daxing International Airport Economic Zone as an example to explore how to promote the high-quality development of the Daxing International Airport Economic Zone and implement the high-quality construction of Beijing's "two districts". The study focuses on the construction of evaluation system for high-quality development of Daxing International Airport Economic Zone, which will enrich the theoretical basis of airport economic zone development, and provide practical evidences for the high-quality development of airport economic zones in China and other developing countries.

2. Selection Basis for High-Quality Development Index System of Daxing International Airport Economic Zone

As a new economic development model with airports as the main body, air transportation as the direction, and multiple industries organically connected, the airport economy has increasingly become a major trend in the world economic development. The Beijing Airport Economic Zone, as the only airport in China with the advantages of free trade pilot zone policies and comprehensive bonded zones across Beijing and Hebei provinces and cities, fully utilizes the new power source advantages of Beijing Daxing International Airport for national development, plays a pivotal role in connecting domestic and international dual circulation, and maximizes the policy dividends of expanding the opening of comprehensive demonstration zones and free trade pilot zones in the national service industry, Its high-quality development has strong connotations,

foresight, guidance, and reference value for the development of the national airport economic zone, and the construction of its high-quality development indicator system also has profound practical significance.

The indicator system selection for the evaluation model of high-quality development is mainly based on three aspects: firstly, theoretical basis. Based on the development of the airport economy and the theory of high-quality development, identify the relevant influencing factors of the high-quality development of the airport economy, and determine the possible indicator selection; The second is academic basis, which is to determine the possible indicator selection based on the analysis of existing academic research literature; The third is the practical basis, which is to determine the possible indicator selection based on on-site interviews with frontline staff in the airport economic zone of Daxing International Airport. Finally, conduct expert argumentation, invite industry experts to conduct expert argumentation on the indicator system, and ultimately determine the selection of the indicator system.

2.1. Theoretical Basis

The formation mechanism of airport economy is not only closely related to the development of the airport itself, but also influenced and constrained by various aspects such as the industrial structure and economic policies in the hinterland. The essence of the airport economy is centered around the airport and its surrounding areas, with the airport industry as the carrier, supported by the economic development level of the hinterland, and formed through the coordinated development of the airport and hinterland economy through the comprehensive transportation system connecting the airport and the hinterland. According to industrial agglomeration theory, growth pole theory, regional economic growth theory, and industrial chain theory, the influencing factors of the airport economy development can be analyzed from the spatial level Explain from three aspects: economic and policy (**Table 1**).

Table 1. Decomposition of Factors Influencing the airport economic zone at the theoretical level.

Impact Level	Influence Factor
Spatial level	Airport system construction
	integrated transport system
Economic level	Talent and Education Research Support
	producer service
	technological innovation
Policy level	Foreign Trade Policy
	Industrial development policies
	Policies for coordinated development of airport economy and hinterland economy

2.2. Space Level Influencing Factors

1) Airport

Different from general economic mode, the airport economy develops with the emergence of airports with airport functions, therefore, the emergence and development of airports are the prerequisites for the formation and development of the airport economy. As an important transportation infrastructure, airports are the connecting link between the airport economy and global economic activities. The number of airport routes and the size of transportation business have a significant impact on the formation and development of the airport economy. With the significant growth of air passenger and cargo volume, the global expansion of route networks, and the continuous advancement of economic globalization, the spatial convergence and externalities of airports themselves have led to a continuous reduction in the spatial and temporal costs of air transportation, which is conducive to the enhancement of regional mobility and allocation efficiency of production factors such as talent, technology, and capital, and provides a factor foundation for the formation of airport economy in the airport area. At the same time, the airport economy has a significant spatial dependence on airports. The spatial spillover and polarization effects of the airport economy itself have accelerated the development of airport aviation and non-aviation businesses, especially non-aviation businesses, which mainly include business consulting, tourism exhibitions, entertainment accommodation, etc. The development of non-aviation businesses has closely linked the economic and social activities of airports and hinterland regions, playing a positive role in promoting the growth of both the airport economy and the hinterland economy.

2) Comprehensive transportation system

The comprehensive transportation system refers to the transportation network connecting the airport and the hinterland area. The diversity of transportation modes (such as railways, highways, waterways), network coverage density, and accessibility of the hinterland area have a huge impact on the development of the airport economy and the hinterland economy, determining the internal communication ability of the airport economy and the depth of its economic impact on the hinterland economy. It is the connecting channel for the airport economy to exert its polarization effect. At the same time, a convenient landside transportation system is a prerequisite for the smooth flow of passenger and cargo flow caused by air transportation. This ability to handle the rapid flow of production factors is an important factor that time-sensitive enterprises with strict requirements for transportation timeliness consider when selecting sites and setting up factories.

2.3. Economic Impact Factors

From an economic perspective, talent and education research, technological innovation, and productive service industries provide important support for the formation and development of the airport economy.

1) Talent and Education Research Support

The high-end development characteristics of the airport industry determine its demand for high-level and specialized talents. Therefore, the supply of professional talents is the key to the development of the airport economy and the promotion of its agglomeration. At the same time, the upgrading of the airport industry to the high-end links of the industrial chain, and the input of advanced production factors from the productive service industry to the airport industry, all rely on professional knowledge talents. The effective supply of talents provides the necessary human capital and knowledge reserves for the development of the airport economy. At the same time, with the expansion of the development scale of the airport economy and the improvement of regional economic influence, it will continue to attract more corporate headquarters and R&D departments from different regions to gather in the airport economic zone. This will inevitably require the support of educational and scientific research institutions that are matched with their development. By providing excellent educational services to enterprises in the zone, educational and scientific research institutions will ensure the talent supply required for knowledge intensive high-tech enterprises in the airport economic zone. By providing intellectual and technological support for the development of the airport economy, promoting the integration of productivity and technology, and creating more wealth. For example, providing high-end professional talent support for technology research and development, product design, and other enterprises in the airport economic zone, promoting the close integration of internal medicine and productivity in the zone, providing labor security for the development of high-tech enterprises in the zone, and providing strong talent and technological support for attracting knowledge intensive high-tech enterprises in the airport economic zone.

2) Productive service industry

The improvement of operational efficiency and competitiveness of the airport economy not only comes from its own development, but also from the input of advanced elements into the productive service industry. With the intensification of global competition, the demand for various productive service industries in the development process of the airport industry is gradually increasing. While effectively promoting the development of productive service industries, the coordinated development of the two is also the driving force for the development of the airport economy. The allocation and development of productive service industry is an important means to reduce industrial transaction costs and enhance industrial competitiveness under the condition of expanding the production scale of the airport industry in the area. The improvement of the competitiveness of the airport economy in the productive service industry mainly comes from three aspects:

Firstly, due to the gradual expansion of the development scale of the airport economy, higher requirements have been placed on production, operation, and organizational efficiency. This has led to the continuous expansion of market

demand for productive services, which will inevitably promote further specialized division of labor among relevant industrial departments. Relevant industries in the airport economy (such as manufacturing) could obtain specialized services in the market, which enables the airport industry to focus on high-end links in the industry chain such as core technology research and development, while outsourcing non-core links to productive service industries that can provide specialized services. Therefore, outsourcing the service links that the enterprise is not good at to specialized service companies not only allows the limited advantageous resources of the enterprise to focus on its core links, but also effectively reduces the total production cost of the enterprise.

Secondly, due to the large amount of knowledge, technology, and human capital contained in the productive service industry, its service elements have the characteristics of being difficult to imitate and sustainable in creating value. By embedding increasingly specialized knowledge capital, technology capital, and human capital into the production and service of goods, the contribution rate of the service industry in related air industries is enhanced.

Finally, the improvement of productive service industry efficiency has effectively reduced the transaction costs of related production activities during the development of the airport economy, thereby supporting the further expansion of the airport industry in terms of product added value and market competitiveness. For example, the information service industry further enhances the information advantage of enterprises while providing technical support to reduce production costs. The accommodation, catering and other service industries not only provide convenient living conditions for residents in the region, but also effectively reduce living costs and create a good investment environment, which plays a crucial role in attracting airport industries to settle in the airport economic zone.

3) Technical innovation

The theory of regional economic growth believes that technological innovation is one of the important factors affecting regional economic growth. It is believed that the development of production depends to a greater extent on the improvement of production efficiency, thereby improving the full use of existing resources. However, this largely depends on technological innovation. Enterprises relying on technological innovation can not only improve the quality of their equipment, optimize the allocation of existing resources, thereby improving the regional production organization capacity, and promoting industrial upgrading. At the same time, it can also improve the quality of workers, thereby making a qualitative leap in the output capacity of production factors.

As a new form of regional economic development, the airport economy has its own characteristics and has the universality of general regional economic development. Therefore, the promoting effect of technological innovation on regional economic growth is also applicable to the airport economy. In other words, the promoting effect of technological innovation on the airport economy runs

through the entire development of the airport economy. For example, in the initial stage of airport economic development, airport economic zones mainly focus on developing transportation services with low technological added value and low technological level, as well as traditional manufacturing industries. Under the support of production factors related to the hinterland economy, some high-tech enterprises carry out technological innovation in order to obtain excess profits. With the widespread application of innovation achievements, the overall technological level of enterprises has been greatly improved. Through industrial linkage and other effects, some high-tech industries in the hinterland region that rely on air transportation have emerged in the airport economic zone, these airport-oriented industries have chosen their location in the airport economic zone, becoming an important component of airport economic development. Therefore, technological innovation has promoted the high-end development of the airport economy, which is a key factor in the development of the airport economy.

2.4. Policy Level Influencing Factors

The government's policy guidance is an important influencing factor for the development of the airport economy. A sound policy support can effectively promote the rapid development of the airport economy. On the one hand, opening to the outside world has been the most important economic policy since the economic reform, effectively promoting inter regional trade, including foreign trade. With the growth of inter-regional trade volume, the greater the comparative advantage of regional exportable products and the stronger the market competitiveness of exported products, the more it can promote the development of inter-regional trade, leading to an increase in external demand for the region, The production and export of goods inevitably generate a demand for transportation services, including air transportation, which in turn creates more opportunities for the development of the airport economy. On the other hand, government support policies are important guidelines for the development of the airport economy, controlling the direction and evolution path of the airport economy. The government can screen and screen the industries developed by its airport economy through differentiated development policies and market mechanisms, which can effectively promote the optimal allocation of related resources and avoid resource mismatch; Gradually eliminate industries with no or weak correlation in the airport economic zone, and promote the continuous improvement of the industrial quality of the airport economy.

Finally, for the government of the city where the airport is located, cultivating new economic growth points, and promoting economic growth in the hinterland are important strategies for developing the hinterland economy. To avoid problems such as isomorphism and disorderly development of the airport economy and the hinterland economy, the government will promote the development of the airport economy through policy incentives and other measures, and consider

the coordinated development of the airport economy and the hinterland economy.

2.5. Academic Basis

In recent years, the rapid development of China's air economic development has become a new engine that improves regional comprehensive strength in the new normal (Zhao et al., 2019; Cai et al., 2017). With the comprehensive development of airport infrastructure construction and the acceleration of supporting functions, the impact of the air economy on regional economic growth, industrial structure, and urbanization process has become more obvious, and it has become an important means of integrating the regional economy into the world economy (Ban, 2018). Essence This fully reflects the new port of airport as a new port that does not rely on the advantages of the coast and the river, and will become an important functional support for the "curve overtaking" in the inland area.

However, due to the different development environments and influencing factors in various regions, how to measure the level of economic development scientifically and reasonably in the air in the air, and find out the key factors that restrict the development of development have become a key issue for the further development of the current air economy, which attracted domestic and international attention. Based on the perspective of the airport, Baker et al. (2015) taking 88 regional airports in Australia as an example, proved the two-way positive relationship between airports and regional economic growth. Based on the fusion perspective of the airport and the city, taking the Aduv Suarez airport in Spain as an example, Diez-Pisonero (2019) studied the role of the airport, found that airport acts as the urban economic center and links Spain with transportation hubs in other parts of the world.

Based on a similar perspective, Xue Hexiang (2017) takes Zhengzhou Airport as an example, and constructed the Economic Zone and Hinterlans Economic Cooperation Evaluation model, from three aspects of the policy environment, the development of the aviation industry, and the location advantage of the location. Wang et al. (2017) established an evaluation index system for the quality development of airport economic zones, which includes four primary indicators: basic conditions, industrial development, radiation effects, and development environment. They also used the GEMS method to establish an evaluation model. Ma Xiaoke (2017) used theoretical analysis methods to study the mechanism of action between the airport economy and regional economy, and pointed out that the development of airport industries and airport economic zones can greatly promote the rise and development of the entire regional economy. Cao Yunchun et al. (2016) used systems theory for qualitative analysis, emphasizing the interactive relationship between the airport, industry, and airport new city in the development of airport economy (Saaty, 1986, 1990). He (2019) applied Per capita GDP and proportion of tertiary industry as the indicator of regional economic

system, and established “free trade + airport economic zone” evaluation model. Economic development status is also constructed into the index system to evaluate the economic and industrial performance of the area (Cui & Cao, 2010), together with airport construction level (Ma & Qi, 2018; Tan & Lu, 2013) to evaluate the pulling efficiency in regional economy of the airport. Studies also concerned the economic adaptability (Chen & Xuan, 2018) and urban city construction effect (Cao & Shen, 2013) of the airport.

Based on existing research, the indicators that affect the development of airport economy are shown in **Table 2**.

2.6. Realistic Basis

The construction of an indicator system for the high-quality development of airport economic zones is a relatively new academic issue, involving the definition of the connotation of high-quality development in airport economic zones. It has both objectivity and subjectivity, and requires both theoretical and academic foundations as well as practical foundations. The project team invited relevant management personnel from the Daxing Airport Economic Zone Management Committee, leaders of relevant enterprises in the Daxing Airport Economic Zone, and frontline staff of the Daxing Airport Economic Zone to conduct

Table 2. Selection of airport economic evaluation indicators in existing studies.

dimension	Indicator selection	source
Airport radiation operations radiation operations	Passenger throughput, cargo throughput, flight density, number of international routes, number of base airlines	7, 9, 12, 13
Airport construction level	Aircraft takeoff and landing sorties, runway length, and apron area	7, 9, 12, 14, 15
Hinterland support function	Regional Gross Domestic Product and Per Capita Gross Domestic Product	7, 9, 12, 13
Regional economic system	Per capita GDP and proportion of tertiary industry	7, 9, 12, 16
Industrial performance	Value added of industries, value added of industries above designated size, number of multinational enterprises	12, 13
Innovation activity	Number of research and development (R&D) personnel, proportion of R&D enterprises and research institutions among new entrants in the year	14, 17
Economic growth rate	Per capita GDP and per capita disposable income of residents	13, 16, 17
geographic conditions	Ground transportation accessibility, operating mileage of urban railways and highways	17

interviews. The key points of the frontline interviews were summarized, and the demands for the practical development of the Daxing Airport Economic Zone were drawn (Table 3).

3. Construction of High-Quality Development Index System for Daxing International Airport Economic Zone

3.1. Selection of Alternative Indicators Based on Expert Evaluation

Based on the theoretical, academic, and practical basis for indicator selection, the project team combined the theory of high-quality development and its current application in China to analyze the high-quality development of Daxing

Table 3. Frontline interviews in Daxing airport economic zone.

system	First level	second level
Policy efficiency system	Policy consistency	Cross regional policy consistency Public service consistency
	Policy operational efficiency	Approval efficiency within the area Policy dividend for enterprises in the area
Industrial system	Development of high-end industries	High end industrial agglomeration Introduction of high-end industry talents Spillover of airport pillar industries
	Development of airport industry	Value chain of airport industry Airport Industry Chain
Airport system	International aviation hub functions	Route, passenger transportation, and freight transportation
	Domestic aviation hub functions	Route, passenger transportation, and freight transportation
Urban system	Regional economy	GDP, industrial structure, trade, and consumption within the region
	Public services within the area	Supporting facilities for medical, educational, commercial, cultural and other services in the area
Regional Collaborative System	Transportation coordination	Public transportation, subway, high-speed rail
	Industrial Collaboration	Cross regional industrial collaboration within the airport economic zone
		Airport Economic Zone and Industrial Collaboration in Beijing
	Market synergy	Talent flow within the airport economic zone
		Resource flow within the airport economic zone
Public service collaboration	Coordination of health and education services within the airport economic zone Collaboration between Airport Economic Zone and Beijing Health and Education Services	

Table 4. Expert evaluation results of high-quality development alternative indicators for daxing international airport economic zone.

Serial Number	Indicator Name	score	expert opinion	Preserve results
1	Consistency of cross regional industrial policies	1.0	Difficult to quantify	Not reserved
2	Cross regional service standard consistency	1.0	Difficult to quantify	Not reserved
3	Operational efficiency of cross regional policies	0.85	Approval efficiency, approval time	hold
4	Policy dividend within the region	0.20	It is not easy to measure and needs to be compared with policies of other airport economic zones	Not reserved
5	Airline Industrial Structure	0.45	Using the proportion of GDP in various industries	hold
6	Development of high-end industries in the airport area	0.25	Not using the absolute value of industrial output value, but using the proportion of high-end industries	hold
7	Development of high-end industries in airport areas	0.81	Can use the proportion of the number of enterprises in the industry and the proportion of enterprise occupied area	hold
8	Technological innovation in the airport area	0.28	Number of patents and proprietary technologies available for use	hold
9	Coordination of Highway Traffic in Airport Areas	0.32	Number and kilometers of highways available for use	hold
10	Airport bus system	0.35	Number of buses, kilometers, and passenger capacity; Number of subways, kilometers, and passenger capacity	hold
11	Airport Railway System	0.09	Number of high-speed trains, high-speed trains, general trains, kilometers, passenger capacity	hold
12	Cross regional collaborative development of industries in airport areas	0.05	Proportion of industrial output value for cross regional development	hold
13	Cross regional collaborative development of airport industry	0.05	Number and proportion of cross regional construction industries	hold
14	Cross regional collaborative development of enterprises in airport areas	0.05	Number and proportion of cross regional operating companies	hold
15	Coordinated Development of Cross regional Economic Elements in Airport Areas	-0.02	It is not easy to measure, and there is duplication in coordinated development with industries, industries, and enterprises in the airport area	Not reserved

Continued

16	Number of cross regional upstream and downstream companies	-0.54	Overlapping with cross regional collaborative development of enterprises in the airport area	Not reserved
17	Airport enterprise cluster	0.20	Scale and output value of industrial clusters	hold
18	Green development of various industries in the airport area	0.42	Emissions of carbon dioxide, wastewater, etc., percentage	hold
19	Green development of various industries in the airport area	0.41	Emissions of carbon dioxide, wastewater, etc., percentage	hold
20	Green development of enterprises in the airport area	0.41	Emissions of carbon dioxide, wastewater, etc., percentage	hold
21	Energy consumption in the airport area	0.56	Total amount, consumption per unit of GDP	hold
22	Unit energy consumption of the airport area	0.21	Overlapping with energy consumption in the airport area	Not reserved
23	Airport passenger transportation in the airport area	0.59	Passenger capacity	hold
24	Airport freight in the airport area	0.59	Freight capacity	hold
25	Airport routes in the airport area	0.59	The proportion of hot routes passing through countries and regions	hold
26	Foreign investment in airport areas	0.07	Total amount and industry proportion	hold
27	Airport Area Attracting Foreign Investment	0.08	Total amount and industry proportion	hold
28	Digital investment in airport areas	0.25	Total investment in the digital economy	hold
29	Cargo trade in the airport area	0.08	Total import and export trade volume, industry proportion	hold
30	Airport service trade	0.08	Total import and export volume, industry proportion	hold
31	Cross border e-commerce in the airport area	0.12	Total transaction volume and industry proportion	hold
32	Cross district public health services	0.23	Service output value and proportion	Reserved
33	Cross regional education services	0.25	Service output value and proportion	hold
34	Cross regional talent sharing	0.24	Number and proportion of cross regional employment talents	hold
35	Cross regional technology sharing	0.22	Number and proportion of cross regional sharing (patents)	hold
36	Cross regional land sharing	-0.20	Not suitable as an indicator for cross regional collaboration	Not reserved
37	Cross regional electronic data sharing	0.27	Quantity and proportion	hold

Table 5. Evaluation index system for high-quality development of Daxing international airport economic zone.

Primary indicators	Secondary indicators	Third level indicators
innovation driven	Policy system innovation and development	Cross regional policy linkage in airport areas Operational efficiency of cross district policies in airport areas Industrial structure of airport area
	Industrial development, innovative development	Development of high-end industries in the airport area Development of high-end industries in airport areas Technological innovation in the airport area
coordinated development	Coordinated development of cross regional transportation	Coordination of Highway Traffic in Airport Areas Airport bus system Airport Railway System
	Coordinated development of cross regional industries	Cross regional collaborative development of industries in airport areas Industrial related development in airport areas
	Cross regional enterprise coordination	Enterprise operation in the airport area Airport Area Enterprise Group
Green development	Green development of industries	Green development of various industries in the airport area Green development of various industries in the airport area Green development of enterprises in the airport area
	Regional green development	Energy consumption in the airport area Unit energy consumption of the airport area
Open development	Open development of airport system	Airport passenger transportation in the airport area Airport freight in the airport area Airport routes in the airport area
	Investment and open development	Foreign investment in airport areas Airport Area Attracting Foreign Investment Digital investment in airport areas
	Trade openness and development	Cargo trade in the airport area Airport service trade Cross border e-commerce trade in the airport area
Development for the benefit of all	Basic service sharing	Public health service sharing in airport areas Sharing of education services in airport areas Talent service sharing in airport areas Technology sharing in airport areas
	Sharing of factor markets	Land sharing in the airport area Electronic data sharing in airport areas

Airport Economic Zone from the perspectives of innovation, coordination, green, openness, and sharing. Five primary indicators, namely innovation driven, coordinated development, green development, open development, and shared development, were initially set, and policy collaborative innovation Industrial development innovation, cross regional transportation coordination, cross regional industry coordination, cross regional factor market coordination, industrial green development, regional green development, airport system opening, investment opening, trade opening, cross regional basic service sharing, cross regional factor market sharing 12 secondary indicators, and 37 tertiary indicators have been preliminarily set based on the 12 secondary indicators.

The project team invited relevant scholars in the field of airport economic research, experts from competent government departments, airport economic zone management personnel, and frontline staff of airport economic zone, totaling 10 people, to form an expert group and rate the 37 alternative indicators shown in **Table 4** to evaluate their content validity. Interviews are focused on the 37 alternative indicators, and the expert group evaluates each indicator and determines whether it is “effective, recommended to be retained” or “not recommended to be retained”. Based on evaluation, experts also need to provide opinions or suggestions on the retention and modification of each indicator, and ultimately combine the findings of multiple case studies for collective discussion. After expert evaluation, the content validity index of a single indicator is: $CVR = (N_e - N/2)/(N/2)$, where N_e is the recommended evaluator for the evaluated indicator to be retained, and N is the total number of evaluators. The value of CVR is between -1 and 1 . If the value is positive, consider retaining the indicator. If the value is negative, do not retain the indicator.

3.2. Construction of the High-Quality Development Index System for the Airport Economic Zone of Daxing Airport

Based on literature review, case studies, and expert evaluation, based on the results of selecting indicators, the project selects five primary indicators: innovation driven, coordinated development, green development, open development, and shared development, resulting in a specific general indicator system for evaluating the high quality development of Daxing International Airport Economic Zone (the results of indicator screening are shown in **Table 5**).

4. Conclusion

This study fully considers the characteristics of high-quality development of the airport economic zone, and constructs the evaluation index system of high-quality development of the airport economic zone through theoretical combing, literature review, front-line interviews and expert demonstration based on theoretical, academic, and practical basis. However, due to the inherent difficulties in the evaluation of high-quality development of airport economic zones and the limitations of survey data, the index system proposed in this study could continue to

be deepened and improved in the future:

1) Improve the indicator system in real time. With the rise of the emerging airport industry, new airport economic development categories and formats will continue to emerge, and the development indicators of the airport economic zone should also be in the process of dynamic change. The indicator system must be dynamically adjusted and updated in real time according to the latest situation of industry development and specific feedback from evaluation work.

2) Take full use of rolling data. Due to the impact of the economic cycle, it is not scientific to use only one year's data as the basis for evaluation, so the investigation of the airport economic zone should be based on the development of at least the past three years, and the analysis should be based on the indicators of the three years, to better reflect the level and trend of the development of the airport economic zone.

3) Establish an evaluation and monitoring system. Future research should pay more attention to how to establish a monitoring system for the evaluation of high-quality development indicators in the airport economic zone. On the one hand, a reliable monitoring system guarantees the authenticity of the data obtained. On the other hand, it can strengthen the real-time control of the industry dynamics of the airport economic zone, and use it as the basis for policy formulation, to guide the high-quality development of the airport economic zone.

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Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

References

- Baker, D., Merkert, R., & Kamruzzaman, M. D. (2015). Regional Aviation and Economic Growth: Cointegration and Causality Analysis in Australia. *Journal of Transport Geography*, *43*, 23-31. <https://doi.org/10.1016/j.jtrangeo.2015.02.001>
- Ban, Y. (2018). Empirical Analysis of the Coupling Relationship between Airport Economic Zone and Free Trade Zone. *Statistics and Decision*, *34*, 112-114.
- Cai, Y. N., Li, D. L., & Yang, X. J. (2017). Research on the Strategy of "Port Industry City" Collaborative Development in Airport Economic Zone. *Urban Development Research*, *24*, 32-40.
- Cao, Y. C., He, S. Q., & Zhao, B. (2016). Research on the Integrated Development of "Port Industry City" in the Airport Economic Zone. *Regional Economic Review*, *No. 4*, 56-64.
- Cao, Y. C., & Shen, D. Y. (2013). Research on Key Elements of Building an Aviation Metropolis with Airport as the Core. *Port Economy*, *No. 1*, 42-47.
- Chen, X., & Xuan, C. (2018). Evaluation Index System for Airline Economic Adaptability in Jiangsu Province. *Chinese and Foreign Entrepreneurs*, *No. 10*, 44-45.

- Cui, T., & Cao, Y. C. (2010). Evaluation of the Development Status and Determination of Development Stages of Airport Economy. *Technical Economy and Management Research*, No. 3, 110-115.
- Diez-Pisonero, R. (2019). Airports and Cities in the Context of Globalization: A Multidimensional Symbiosis in Adolfo Suarez-Madrid Barajas Airport. *The Geographical Journal*, 185, 4485-4497. <https://doi.org/10.1111/geoj.12299>
- He, X. Y. (2019). A Review of the Research on the “Free Trade Zone + Airport Economy” Model in Inland Regions. *Research on Technology Economy and Management*, No. 12, 136-140.
- Ma, T. G., & Qi, L. (2018). Research on the Factors Influencing the Development of China's Airport Economy: An Empirical Analysis Based on Regional Panel Data. *Macroeconomic Research*, No. 4, 97-109.
- Saaty, T. L. (1986). Axiomatic Foundation of the Analytic Hierarchy Process. *Management Science*, 32, 841-855. <https://doi.org/10.1287/mnsc.32.7.841>
- Saaty, T. L. (1990). How to Make a Decision: The Analytic Hierarchy Process. *European Journal of Operational Research*, 48, 9-26. [https://doi.org/10.1016/0377-2217\(90\)90057-I](https://doi.org/10.1016/0377-2217(90)90057-I)
- Tan, S. X., & Lu, Y. D. (2013). Research on the Evaluation Index System of Airport Driving Efficiency in Regional Economy. *Science and Technology Management Research*, 33, 70-74.
- Wang, B., Zhao, Y. L., & Wang, N. (2017). Comprehensive Evaluation of Airport Economic Zone Development Quality Based on OWA Operator Weights. *Journal of Interdisciplinary Mathematics*, 20, 669-679. <https://doi.org/10.1080/09720502.2016.1259859>
- Ma, X. K. (2017). The Coupling Mechanism between Airport Economy and Regional Economic Development: Taking Zhengzhou Airport as an Example. *Research on Technology Economy and Management*, No. 7, 118-122.
- Xue, H. X. (2017). Collaborative Development Mechanism and Degree Evaluation of Airport Economic Zone: Taking Zhengzhou Airport Area as an Example. *Regional Economic Review*, No. 1, 68-74.
- Zhao, Y. J., Tang, L., Zhu, J. et al. (2019). Strategic Research on the Integration of Port Industry and City Development from the Perspective of Spatiotemporal Coupling: A Case Study of Airport New City in Xixian New District, Shaanxi Province. *Urban Development Research*, 26, 89-96.