The Construction of Evaluation Index System of Aviation Logistics Industry

A Case Study of Zhengzhou Airport-based Zone

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Abstract—The construction of evaluation index system is of great significance for the scientific development of aviation logistics industry. The diamond model proposed by Michael E. Porter is applied to construct a comprehensive evaluation index system for the aviation logistics industry at Zhengzhou airport-based zone by combining with literature study and expert assessment method. Finally, a comprehensive evaluation index system with three levels is formed, where some core indexes for evaluating the development of the aviation logistics industry at Zhengzhou airport-based zone are included. They include the regional gross product per capita; total volume of import and export trade; passengers and freight turnover of air transport; Internet users; business total of posts and telecommunications; general budget revenue in local finance; the number of students in colleges and universities.

Keywords-Aviation Logistics Industry; Industry Evaluation; Evaluation Index System; Construction; Research

I. INTRODUCTION

At present, the construction of airport-based zone booms continuously. The aviation logistics industry has been greatly focused, and its development status is expected to be evaluated in due time, in order to objectively, profoundly and dynamically reflect the current situation of each link and each factor of the aviation logistics industry at Zhengzhou airport-based zone. In addition, it can provide a theoretical basis for the government in several aspects, such as formulating industrial policies and guiding the industry development, as well as the systematic and reasonable management planning. Therefore, to establish a systematic and scientific evaluation system is the prerequisite and foundation for the scientific management of aviation logistics industry, which suggests that it is the top priority to select the evaluation indexes.

There are many factors influencing the development of the aviation logistics industry at Zhengzhou airport-based zone. The advantages and disadvantages of the aviation logistics industry can be actually mastered only by the comprehensive analysis of these factors to predict its development potential.

II. PRE-SELECTING THE INDEXS

According to the classic diamond model by Michael E. Porter in industrial competitiveness research (see Figure 1.), the indexes are pre-selected in combination with literature analysis and expert opinions.

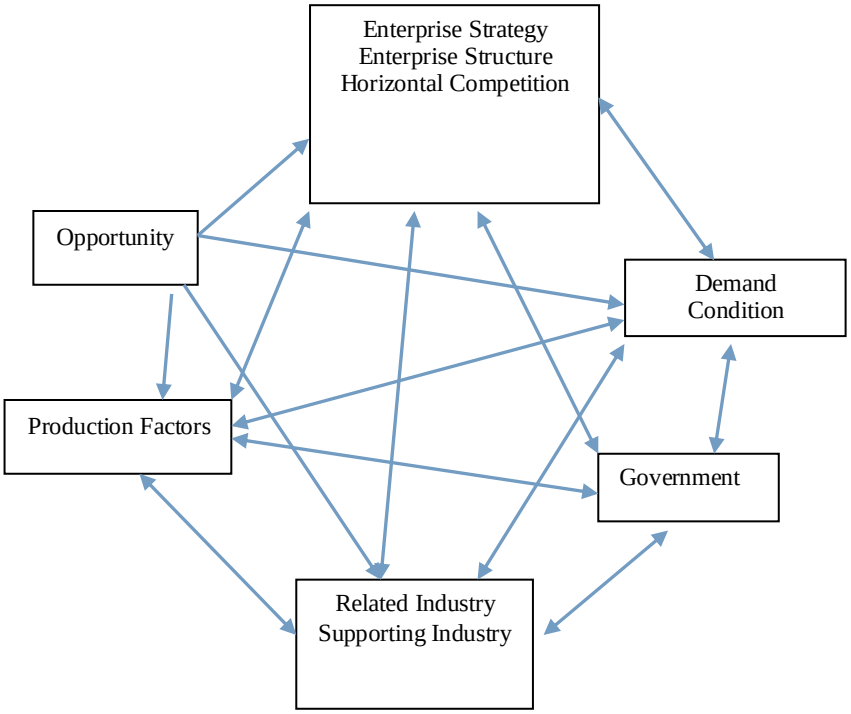

Figure 1. The diamond model by Michael E. Porter

Michael E. Porter considered that a certain industrial competitiveness wins out due to some determinants, including enterprise strategy, structure and horizontal competition, production factors, demand condition, related industry and supporting industry. Meanwhile, industrial competitiveness is also influenced by the effect of opportunity and government, which are called auxiliary factors. Among them, the strategy, structure and horizontal competition of enterprise are the forms of enterprise construction, organization and management, as well as the performance of the competitors in domestic market. In addition, production factors are the required social resources during industrial competition, which are divided into primary factors of production and advanced factors of production; while demand condition is the demand of domestic market and the development motivation of industry. Besides, related industry and supporting industry are used to judge whether the upstream and downstream industries are competitive, and whether they can achieve positive interaction. Moreover, opportunity means some sudden factors; while government refers to government intervention.

From Figure 1, it can be seen that diamond system is a system for biaxial strengthening and interaction, which means that the effect of each factor influences the states of the others. It is possible to form the self-reinforcing business advantage by combing all factors organically and being applied comprehensively.

In order to summarize and learn from the previous researches on the evaluation indexes of aviation logistics, the literatures with high cited frequency in the database of China National Knowledge Internet (CNKI) of Tsinghua Tongfang are searched by using keywords “aviation logistics” and “evaluation”. It is found that there are few researches on the evaluation indexes for aviation logistics. Then the keywords “urban logistics” and “evaluation” are utilized to search the literatures with cited frequency. Combining these search results, 43 literatures are selected. Then the frequency of the indexes used by these literatures is counted up.

The research topic, namely the development of Zhengzhou aviation logistics industry, is considered during index statistics. Owing to Zhengzhou is an inland city, the indexes, such as port, etc. are out of account, while as for aviation, the indexes for the logistics by the other means of transportation, such as highway, railway, etc. are irrespective. Moreover, the indexes are selected by combining the principle of evaluation and preliminarily established an evaluation index set.

TABLE I. PRE-SELECTED INDEX SET

Indexes	Frequency of occurrence
Regional gross product per capita	16
Total freight volume	16
Total retail sales of consumer goods	15
Freight turnover	12
Total volume of import and export trade	10
Local telephone users	8
Total passenger transport volume	7
Business total of posts and telecommunications	7
Total industrial output value	6
Internet users	5
The proportion of tertiary industry	4
Per capita disposable income of the urban households	4
The volume of investment in fixed assets	4
Total amount of telecommunication service	4
Financial revenue	4
The number of students in colleges and universities	3

III. DETERMINING THE INDEXES

Combined with the diamond model of Michael E. Porter, the development of Zhengzhou aviation logistics industry is influenced by many factors, including the demand, supply, the government, etc. In addition to its own carrying capacity for aviation logistics, some external environmental factors should be taken into account. Thereby, Zhengzhou aviation logistics industry can be evaluated from the following four aspects, namely economic competitiveness, the professional ability of aviation logistics, infrastructure construction, the management capacity of government.

Economic competitiveness: Aviation logistics industry is closely associated with economic development. The rapid development of economy is the driving force and material guarantee for the development of aviation logistics industry, which is regarded as the key factor of the demand growth of aviation logistics. Thus, two basic indexes, namely the regional gross product per capita and total volume of import and export trade were selected for evaluation.

The professional ability of aviation logistics: It directly influences the development of Zhengzhou aviation logistics industry. The freight and passengers turnover of air transport are the indexes directly measuring the ability of Zhengzhou aviation logistics, which can effectively evaluate the development level of Zhengzhou aviation logistics industry.

The construction of logistics infrastructure: It plays an important role in the development of Zhengzhou aviation logistics industry. In particular, to construct and improve the information, communication equipment, etc. can greatly promote the modern logistics industry to improve the efficiency of logistics industry and reduce logistics cost so as to improve the quality of logistics industry. It contains two specific indexes, that is to say, the Internet users and business total of posts and telecommunications.

The management capacity of government: Under the condition of market economy in China, the macroeconomic control of government is still of great significance. The scientific and proper supervision of government to the aviation logistics industry can build a favorable mechanism and market environment for aviation logistics industry. In combination with Porter's diamond model, it can be seen that the government intervention has important significance to develop the industry and enhance its competitiveness. Hence, the general budget revenue in local finance and the number of students in universities and colleges were used as index to evaluate.

TABLE II. THE EVALUATION INDEX FOR THE AVIATION LOGISTICS INDUSTRY AT ZHENGZHOU AIRPORT-BASED ZONE

First-grade indexes (A)	Second-grade indexes (B)	Third-grade indexes (C)	Units
Evaluating Zhengzhou aviation logistics industry	Economic competitiveness (B_1)	Regional gross product per capita (C_1)	Yuan
		Total volume of import and export trade (C_2)	10,000 dollars
	Professional ability of aviation logistics (B_2)	Passengers turnover of air transport (C_3)	10,000 people
		Freight turnover of air transport (C_4)	10,000 people mile
	Infrastructure construction (B_3)	Internet users (C_5)	10,000 households
		Business total of posts and telecommunications (C_6)	100 million Yuan
	Management capacity of government (B_4)	General budget revenue in local finance (C_7)	100 million Yuan
		Number of students in universities and colleges (C_8)	10,000 people

IV. CONCLUSIONS

The pre-selected index system of evaluation index was constructed through literature research and expert evaluation method. Eight core indexes were applied as the important indexes to evaluate the development of Zhengzhou aviation logistics industry. The 8 indexes are as follows: regional gross product per capita; total volume of import and export trade; passengers' turnover of air transport; freight turnover of air transport; Internet users; business total of posts and telecommunications; general budget revenue in local finance; and the number of students in colleges and universities. These indexes can explain the issues and reduce the complexity of index system.

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