Study on the Development Model of Logistics System in Shaanxi Free Trade Zone

Wang Yuanyuan

Xian Fanyi University, Xi'an 710105, China

Keywords: Shaanxi; Free Trade Zone; Logistics Node

Abstract: The logistics of Shaanxi Free Trade Zone is an important starting point for the construction of the Silk Road Economic Belt. However, after years of construction, its platform and gathering function have not been effectively played, and its role in leading and leading the development of animal flow industry is limited. Based on the forecasting results of freight volume in Shaanxi Free Trade Zone and the reality of Shaanxi's industrial layout planning and three-dimensional comprehensive transportation development strategic planning, this paper studies the layout scheme and coordinated development strategy of Shaanxi's main logistics nodes. In terms of the balance of supply and demand in logistics, by adjusting the parameters related to logistics supply and demand in the model, and comparing the changes in logistics supply and demand in Shanghai Free Trade Zone before and after the adjustment, the logistics system of Shaanxi Free Trade Zone is obtained to realize the supply and demand: balance needs to increase logistics investment and Improve logistics efficiency. Based on the realization of resource synergy and factor synergy, this paper proposes the realization strategy of coordinated development of logistics nodes in Shaanxi Free Trade Zone.

1. Introduction

With the strategic concept of "one belt and one road" advancing, Xi'an, Shaanxi, as the starting point of the new Silk Road, has brought unprecedented opportunities for the development of Shaanxi's industry. Xi'an international port area is one of its areas. Its positioning is to focus on the development of international trade, modern logistics, financial services, tourism and exhibition, e-commerce and other industries, and build "one belt and one road" international transit hub port, open financial industry innovation highland and Eurasian trade and cultural exchange and cooperation platform [1]. Xi'an has become an important node of the national northwest energy export and sea-going logistics corridor; in January 2017, Xixian New Zone was put under the management of Xi'an, which indicates that the process of integration of Xixian and the construction of Great Xi'an will be accelerated, and provides a historical opportunity for the construction of a new logistics service pattern in Xi'an Logistics industry [2]. All along, relying on various advantages of Shaanxi, Shaanxi is in full swing in the fields of high-tech industry, equipment manufacturing industry and energy chemical industry, providing support for the construction of Shaanxi Free Trade Zone. From a macro perspective, the Shaanxi Free Trade Zone logistics system as a social and economic subsystem, its efficient operation can have an impact on social and economic benefits. From a micro perspective, the Shaanxi Free Trade Zone logistics system can provide horizontal and low-cost logistics services to customer enterprises by effectively organizing logistics activities to ensure the competitive advantage of relevant enterprises in the free trade zone [3].

Through the analysis of the composition of the Shaanxi Free Trade Zone, the development of the logistics industry has been put on the agenda in the development of key industries in the central area and Xi'an International Port Area. At present, there are problems in the development of logistics industry in Xi'an, such as similar functions of logistics nodes, imperfect functions and unreasonable layout of facilities, which seriously restricts the improvement of Xi'an logistics industry service level [4]. With the continuous development of globalization, the role of the free trade zone in promoting the economic development of a country is becoming more and more obvious. Research

  DOI: 10.25236/icebfm.2019.042

on FTA will become a major trend in the future, and logistics as a powerful means to support the development of FTA will also cause a research upsurge of scholars at home and abroad [5]. The paper introduces the methods of determining the scale and quantity of logistics node construction and the location of logistics node into the layout of logistics node in Xi'an, forming a relatively complete theoretical and methodological system for the study of urban logistics node layout. To explore the mechanism of balanced development between logistics supply and logistics demand in Shaanxi Free Trade Zone. To promote the balanced development of supply and demand of logistics system in Shaanxi Free Trade Zone from two aspects of quantity balance and structure balance is of certain guiding significance to the research in the later related fields.

2. The Current Situation of Logistics Node Layout in Shaanxi Province

Based on the previous research data, this paper analyzed the distribution of logistics nodes in Shaanxi Province from the aspects of administrative area distribution, type distribution, spatial layout form, current situation of main logistics nodes construction, and the level of cooperation between logistics nodes and other industries. In recent years, under the support of the "one belt and one way" strategy and driven by the development of e-commerce, the logistics system of Shaanxi free trade area has maintained a rapid growth of under the support of rapid economic development in the hinterland. It is engaged in highway cargo transportation within and between cities, which coincides with the dense traffic location conditions of Weiyang District highway network. At present, Shaanxi has established economic and trade ties with more than 190 countries and regions, and 79 pairs of friendly city relations with 32 countries. The construction of the logistics system in Shaanxi Free Trade Zone can effectively integrate logistics service demand, logistics supply capacity and logistics service functions to provide customers with better logistics services. Through the matching of logistics demand types and logistics service types, we can provide customers with more professional logistics services. On the basis of the construction of the Belt and Road, the logistics construction of the Shaanxi Free Trade Zone has been paid more and more attention. At present, logistics nodes in various districts of Shaanxi form two logistics clusters along the interchange, but they are mainly small-scale logistics centers, with traditional operation methods and less than the scale of land occupation.

If the regional development is in good shape, on the one hand, the improvement of the economic level, the technical level and the optimization and upgrading of the industrial structure will increase the demand structure and scale, and promote the regional logistics demand; on the other hand, the improvement of the logistics environment and the increase of logistics investment will bring the foundation. Sexual protection and financial support will improve logistics supply capacity. At present, Shaanxi's trade and logistics market is booming, showing a thriving trend, which is in line with the development orientation of Xi'an City as a “One Belt, One Road” international trade logistics center. The number of port service-type logistics nodes is the smallest, and half of them are under construction and have not yet been put into operation. The number and quality of enterprises stationed in Shaanxi Free Trade Zone are constantly rising. In addition to logistics enterprises, e-commerce enterprises, retail enterprises and financial leasing enterprises have entered the park one after another, injecting new momentum into the development of the park and improving the industrial system of the park. Logistics demand and supply are mainly related to each other through factors such as logistics shortage, logistics price and logistics revenue. The increase of logistics demand will bring about logistics shortage, and logistics supply will alleviate this shortage. Through the continuous improvement of logistics infrastructure, it can realize the effective connection of logistics nodes, improve the efficiency of logistics operation, and then provide timely and fast logistics services for customers. At present, Shaanxi integrated service logistics nodes are distributed in all districts. Considering that integrated service logistics nodes have many functions, such as processing, warehousing, trading and distribution, it shows that Shaanxi logistics nodes are still in the stage of comprehensive development, and the construction of specialized logistics nodes is insufficient.

3. Determining the Size and Quantity of Logistics Nodes in Shaanxi Province

Determining the construction scale and quantity of urban logistics nodes is the basis for the logistics node layout planning. The urban logistics system includes two main types of logistics nodes: logistics park and logistics center. Due to different functional positioning and business processing capabilities, the number of construction and construction scale of logistics parks and logistics centers are not the same. Compared with other coastal economic regions, there is a clear gap between the economic output and the quantity of goods in Shaanxi. The demand for goods is not strong and the supply is insufficient, which will directly affect the vitality of the logistics park. In terms of warehouse construction, with the continuous active cross-border e-commerce and the landing of pharmaceutical logistics, the construction of cold chain facilities in the region is far from meeting the demand. In addition, water, electricity, heating and other infrastructure facilities are not perfect. Logistics node layout planning mainly considers the balance of supply and demand relationship between the logistics processing capacity of logistics nodes and the quantity of urban logistics demand, so it only involves physical quantity index. Under the influence of "one belt and one road", various forms of international exchange and cooperation activities have come to Shaanxi to bring vitality to Shaanxi's development. In the process of logistics activities, logistics information, as an important factor in coordinating various logistics links, is the guarantee for the smooth operation of logistics activities. In order to accurately carry out the system operation for receiving and dispatching goods, and achieve the close combination of physical flow and information flow, through the application of information system, improve the operation efficiency of logistics, reduce the error rate and improve the service level.

The establishment of multi-level and multi-objective evaluation model is conducive to the analysis of the balanced development of regional logistics supply and demand system, and it is an ideal and effective method for the evaluation of multiple decision-making units and multiple input and output systems. In order to eliminate the random influence, we should take full account of the random influence of accidental factors. When using historical data for statistical analysis, we should deal with the data appropriately and finally get the forecast result of freight volume. The logistics system of Shaanxi Free Trade Zone can provide a reasonable logistics scheme. By constructing a functional model, the paper analyses the correlation between freight volume and economic, population, per capita income, and predicts freight volume. Thereby achieving an effective connection of various logistics nodes, reducing irrational phenomena in transportation, warehousing, etc., thereby reducing transportation costs and storage costs. If the feature structure is valid, the output of the feature has reached its maximum relative to the input, and the decision unit is at the boundary of the production possibility. The premise of using multiple linear regression is that the variables are irrelevant and independent variables, but the freight volume is affected by multiple factors. It is difficult to guarantee the non-collinearity between variables when selecting the index system. The logistics system of Shaanxi Free Trade Zone must continuously improve its logistics infrastructure, ensure the smooth flow of logistics channels, reduce inefficient logistics activities, and reduce logistics costs.

The rapid development of industry will bring about an increase in the demand for raw materials and intermediate products, which will lead to an increase in total social output, which will directly lead to a sharp increase in the total volume of social cargo transportation and social goods, especially the increase in long-distance cargo transportation. The Shaanxi Free Trade Zone should be based on the adjustment of the park planning, increase capital investment, large-scale rectification due to the disadvantages caused by excessive costs, and constantly improve the construction of infrastructure, such as lines, nodes, communications, and hydropower in the port area. Logistics supplier receives customers' demand for logistics services, allocates logistics resources, organizes logistics activities, and provides logistics services such as transportation, joint storage, packaging, circulation processing, skillful customs declaration and inspection for logistics demanders, so as to realize the final delivery of goods. Through the construction of network information platform, we can ensure the timeliness and accuracy of financial information, and reduce the possibility of human influence in the processing of enterprise financial information. At

present, more than 95% of Shaanxi's logistics transportation is completed by road transportation. The level of truck ownership will significantly affect the total capacity of road transportation, and then affect the total demand of urban logistics. These include wholesale and retail enterprises and business and trade enterprises with large logistics demand. Therefore, with the continuous presence of enterprises in Shaanxi Free Trade Zone, the logistics demand of Shaanxi Free Trade Zone will increase.

4. Logistics Node Layout Scheme of Shaanxi Free Trade Zone

Firstly, the number and scale of logistics nodes at all levels should be determined reasonably according to the needs of regional logistics operations. Secondly, the time and space distance between logistics suppliers and logistics demanders can be effectively shortened by the allocation and layout of the number and geographical location of nodes, and the flow rate of goods in the region can be accelerated. We should make full use of the favorable policies of the free trade area and make the park a bright spot in the "one belt and one road" with a more open attitude. Enterprises in the region should be provided with corresponding policies, tax preferences and one-stop services to effectively attract enterprises; to facilitate the import and export of goods, reduce customs clearance procedures, in order to effectively gather goods. Since there is a strong correlation between the level of economic development and logistics demand, logistics demand can be said to be the derivative demand of economic activities. Therefore, the level of economic development in Shaanxi reflects the level of logistics demand in Shaanxi to a certain extent. Through the differential positioning of the functions between the logistics nodes, the core competitiveness of each logistics node is clarified, so that all major logistics nodes can concentrate on developing their core capabilities, thereby reducing the similarity of service provided between logistics nodes. Therefore, the size and direction of logistics demand match the degree of logistics development in the region, which is the main factor determining the balance of internal development of regional logistics demand system.。

As the economic transformation and supply-side structural reforms will bring about changes in the supply structure and changes in the supply structure, the transportation structure is bound to undergo major changes. From the actual development of logistics in Shaanxi Free Trade Zone, it has already established the basic conditions for the development of multimodal transport. As a basic industry in the national economy, the logistics industry mainly plays a role in service and business support for other industries. By combining the logistics needs of other industries with the layout of logistics nodes, each industry is no longer considered an isolated subject. When the logistics supply is less than the logistics demand, the logistics supply shortage will increase the logistics supply shortage; When the supply of logistics exceeds the demand of logistics, the increase of logistics demand will reduce the supply of logistics. The construction cost of logistics nodes is high, the construction cycle is long, and the operating profit margin is low. In order to reduce the investment in fixed assets, the existing logistics infrastructure should be fully evaluated when the layout of logistics nodes is carried out. Through overall planning of logistics supply and demand network, strengthening the connection between nodes, avoiding duplicate construction and unreasonable planning, we can improve the spatial and temporal benefits of logistics links, and then promote the coordination and synchronous development of logistics supply and demand in surrounding areas.

Taking full account of the speed of urban development and the expansion scale of logistics demand, on the premise of ensuring that logistics nodes meet the current demand, reserve certain supply capacity to meet the logistics needs in the short and medium term in the future, so as to promote development by planning and avoid restricting the function of logistics. From the point of view of Shaanxi FTA managers, we should do a good job of publicity at home and abroad, adopt the policy of going out and inviting in, and attract powerful and influential large-scale logistics enterprises at home and abroad as well as dynamic and promotional local small and medium-sized logistics enterprises to settle in Shaanxi FTA. The improvement of the economic development level of Shaanxi Free Trade Zone can increase the demand for animal flow, thus creating more output

value of the logistics industry. Some of the capital of the logistics industry will be invested in its own development, forming a logistics investment amount. Strengthen the management of regional logistics supply and demand multi-agents, integrate logistics resources, and standardize logistics construction. On the one hand, the two sides of the logistics supply and demand main body should develop cooperation and competition on the basis of mutual communication and coordination, establish a fair and standardized strategic alliance, strengthen deep integration, and realize the overall optimal allocation of logistics resources between the supply and demand sides. In this way, the leap-forward development of various logistics node subsystems is promoted. With the mutual dependence and cooperation of various logistics node subsystems, the overall competitiveness of the regional logistics system will be improved.

5. Conclusion

In order to realize the coordinated development of logistics nodes in Shaanxi Free Trade Zone, we should seek mutual synergy and symbiosis with the realization of resource synergy and factor synergy. Detailed analysis of its constituent logistics demand main body, logistics supply main body, logistics infrastructure system, logistics information system and logistics support system. The same-level logistics nodes should first identify their core business and main service objects, and describe the characteristics of the service objects in detail, and clarify their respective resource endowment advantages and core competitiveness sources. Through the analysis and Research on the logistics system model of Shaanxi Free Trade Zone, the paper analyses the quantity balance of logistics supply and demand and the structure balance of logistics supply and demand respectively. Regions should adjust the structure and scale of logistics supply based on logistics demand, that is, to provide specialized, individualized and differentiated logistics supply services according to different logistics demand, so as to improve the effectiveness and development coordination of supply and demand system.

Acknowledgement

Soft science project of Shaanxi science and Technology Department: Research on the path of productivity cooperation between Shaanxi and Central Asian countries based on Xi Jinping's "one belt and one road" thought(Project No. 2019KRM043) and Xi’an FANYI University Team Construction Project:Industrial docking study of the Silk Road Economic Belt(Project No. XFU17KYTDA02).

References

[1] Bansia M, Varkey J K, Agrawal S. Development of a Reverse Logistics Performance Measurement System for a Battery Manufacturer[J]. Procedia Materials Science, 2014, 6:1419-1427.

[2] Ramos T R P, Gomes M I, Barbosa-Póvoa, Ana Paula. Planning a sustainable reverse logistics system: Balancing costs with environmental and social concerns[J]. Omega, 2014, 48:60-74.

[3] Gligor D M, Holcomb M. The road to supply chain agility: an RBV perspective on the role of logistics capabilities[J]. International Journal of Logistics Management, 2014, 25(1):327-378.

[4] Khan S A R, Dong Q L, Yu Z. Research on the Measuring Performance of Green Supply Chain Management: In the Perspective of China[J]. International Journal of Engineering Research in Africa, 2016, 27:167-178.

[5] Pletneva N, Koshcheyev V. Logistics of a Building Company: Specifics and Methods of Logistics System Management [J]. Applied Mechanics and Materials, 2015, 725-726:1013-1018.