

Industrial Development Status and Suggestions of Urban Agglomeration in Northeast Sichuan based on Location Quotient Analysis

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Abstract

In the process of urban development, the industrial structure and the industrial division of labor cannot be ignored. Although the state has issued a series of policies to promote the development of urban agglomeration, there are still many problems. The paper selected the five cities in the northeast of Sichuan as the research object, using the method of location quotient analysis, in 2012 and 2018 of northeastern Sichuan urban agglomeration of economic development and industrial structure are analyzed, and found the problems of urban agglomeration industry in northeast Sichuan: primary industry proportion is too large, the second industrial structure adjustment error, the third industry, the low degree of specialization. And on the basis of industrial structure optimization and industrial development, the suggestions to increase the overall strength of the city cluster in northeast Sichuan.

Keywords

Location Quotient; Northeast Sichuan Urban Agglomeration; The Industrial Structure.

1. The Research Background

Since the concept of urban agglomeration development was first proposed in the 11th Five-Year Plan in 2006, The State Council has successively approved 11 urban agglomeration development plans, gradually forming a new pattern of coordinated development of large, medium and small cities and small towns with urban agglomeration as the main body [1]. In recent years, Chengdu-Chongqing urban agglomeration as an important strategic positioning urban agglomeration, its economic and social functions have been greatly supplemented. In 2011, the National Development and Reform Commission issued the "Chengdu-Chongqing Economic Zone Regional Planning". In 2016, the National Development and Reform Commission and the Ministry of Housing and Urban-Rural Development jointly issued the Chengdu-Chongqing Urban Agglomeration Development Plan. In 2018, the CPC Central Committee and The State Council clearly required that Chongqing and Chengdu, two megacities, be the center to lead the development of the Chengdu-Chongqing urban agglomeration and drive the integrated development of relevant sectors. In 2019, it was made clear that the strategic position of the Chengdu-Chongqing city cluster was the same as that of the Beijing-Tianjin-Hebei city cluster, the Yangtze River Delta city cluster, and the Guangdong-Hong Kong-Macao city cluster. On October 20, 2021, the CPC Central Committee and The State Council issued the Outline of the Construction Plan of Chengdu-Chongqing Twin Cities Economic Circle. In 2021, the Chengdu-Chongqing economic circle realize the region's GDP totaled 7.39192 trillion yuan, accounting for 30.8% of the western region, northeastern Sichuan urban agglomeration as an important part of Chengdu-Chongqing urban agglomeration, for the development of Chengdu-Chongqing urban agglomeration transport a large number of high-quality workforce, as Chengdu-Chongqing axis city group, northeastern Sichuan urban

agglomeration's strategic position has been further improved, The northeast Sichuan city cluster is a bridge that integrates Chengdu and Chongqing.

Many scholars in view of the development of urban agglomeration industry, industry division, industry agglomeration put forward many valuable conclusions, Yin should be analyzed key endowment structure similar to that of Yangtze river delta region of the status quo of industrial convergence, think too much high-level manufacturing inhibits the growth of [2], Ms. Wang by gini coefficient, and the location quotient ratio index, Measure the industrial division model of regional development [3]. Chai Zhijian believes that urban functional specialization promotes the growth of urban service industry, but has a certain inhibitory effect on industrial efficiency [4]. Cui Xiangyang calculated the industrial division of three city agglomerations in Suzhou by using the research method of location quotient [5]. Yan Yanbiao analyzed the influencing factors of regional industrial division of labor positioning, studied regional characteristics and industrial choice preference, and the Beijing-Tianjin-Hebei industrial synergy model [6].

2. Industrial Status of Urban Agglomeration

2.1. Research Area

This paper selects the northeast Sichuan urban agglomeration as the research object. The administrative region of northeast Sichuan urban agglomeration involves Dazhou city and Guang'an city in east Sichuan and Nanchong, Bazhong city and Guangyuan city in north Sichuan. Among them, Guang'an city, Dazhou City and Nanchong City are also cities in Chengdu-Chongqing economic circle. Northeast Sichuan city cluster is not only generated from Chengdu-Chongqing economic circle but also a supplement to it. Meanwhile, northeast Sichuan city cluster is also a bridge and corridor connecting Shaanxi, Sichuan and Chongqing. Northeast Sichuan belongs to the Ba culture area, and together with the Shu culture area, they constructed the brilliant Ba and Shu civilization.

2.2. Industrial Development Status

Table 1. Status quo of urban agglomeration in northeast Sichuan

Index	population		GDP		GDP per capita		Urbanization	
	2012	2018	2012	2018	2012	2018	2012	2018
Nanchong	630	644	1180	2006	1.88	3.13	39.34%	48.14%
Guang'an	322	324	753	1250	2.34	3.85	32.91%	41.86%
Dazhou	549	572	1135	1690	2.07	2.97	36.10%	45.52%
Guangyuan	253	267	469	802	1.87	3.01	36.42%	45.63%
Bazhong	331	332	372	645	1.12	1.95	33.22%	41.85%

Data source: Sichuan Statistical Yearbook 2018, Sichuan Statistical Yearbook 2013

The data in Table 1 are the year-end total population, GDP, per capita GDP and urbanization rate of the urban agglomeration in northeast Sichuan in 2012 and 2018. It can be clearly found from the table that the overall economic strength of the urban agglomeration in northeast Sichuan is not high and the internal differences are large. In terms of population, Nanchong and Dazhou have passed the 5 million mark, while Guang'an, Guangyuan and Bazhong have about half the population of Nanchong. Although the total population of northeast Sichuan accounts for about one quarter of the population of Sichuan Province, and Nanchong and Dazhou are the top cities in the population of Sichuan Province, from the perspective of population growth, the population growth of northeast Sichuan urban agglomeration is slow and the new population is small. During the six years from 2012 to 2018, the population of northeast Sichuan increased by about 500,000, among which the net increase of population in Guang'an and Bazhong was less than 30,000, indicating that the two cities have a great shortage in attracting talents to

settle down and stabilizing the population. It is worth noting that Bazhong's GDP in 2018 was only one third of Nanchong's and one half of Dazhou's and Guang'an's. There are still big gaps in its economic development.

Overall, as the promotion of urbanization rate and the per capita GDP growth, the overall development of urban agglomerations in northeast Sichuan is showing a good momentum, although still faces the economic disparity between the city is bigger, the regional infrastructure is imperfect, regional economic foundation is weak.

Table 2. Ratio of two industries in northeast Sichuan Urban agglomeration

Year	2012	2018
Nanchong	22.87:51.65:25.44	19.03:41.07:39.88
Guang'an	18.6:52.18:29.17	13.87:46.01:40.11
Dazhou	21.92:53.3:24.77	19.30:35.73:45.00
Guangyuan	19.59:47.00:33.4	14.72:44.71:40.55
Bazhong	24.97:44.97:34.89	15.21:48.98:35.79

The data in Table 2 is the industry ratio of the urban agglomeration in northeast Sichuan in 2012 and 2018. On the whole, the industrial structure and industrial division of labor have been adjusted in northeast Sichuan city agglomeration. Comparing the data of two years, the proportion of primary industry and secondary industry is declining, only the proportion of tertiary industry is increasing. Among them, the tertiary industry of Dazhou city has become the leading industry, and the tertiary industry of Guang'an city and Nanchong City has caught up with the proportion of the secondary industry, indicating that the government of northeast Sichuan city agglomeration vigorously promotes the development of the tertiary industry.

From the perspective of the adjustment trend of industrial structure, northeast Sichuan city group has invested a lot of energy in the transformation of urban industrial structure, and has achieved certain results. However, there are still problems that the proportion of primary industry is too large, the secondary industry is still the dominant industry, and the tertiary industry is not enough. The industrial structure needs further adjustment.

3. Calculation and Analysis of Location Quotient

3.1. Location Quotient Analysis

Location quotient, also known as regional scale advantage index or regional specialization rate, was first proposed by Hargate and is often used to analyze regional industrial layout and industrial advantage in modern economics [7]. If the location quotient calculation result is greater than 1, it can be considered that the industry is a specialized department of the region. The higher the location quotient, the higher the specialization level. If the calculated result of location quotient is less than or equal to 1, the industry is considered to have no regional core attack capability, and the industry is considered to be a self-sustaining sector. By calculating the industrial location quotient of a city or region, we can find out the dominant industries in the region, and provide some strategies for industrial structure adjustment and policy release. Its calculation formula is as follows:

$$LQ_{i,j} = \frac{L_{ij} / L_i}{L_j / L}$$

3.2. Location Quotient Analysis

Using the formula of location quotient, combined with the industrial structure data of northeast Sichuan urban agglomeration in 2012 and 2018 and the industrial structure data of Sichuan province in 2012 and 2018, the results are shown in Table 3.

Table 3. Location quotient of three major industries

Index	Primary		Secondary		Tertiary	
	2012	2018	2012	2018	2012	2018
Nanchong	1.69	1.75	1.10	1.09	0.65	0.78
Guang'an	1.37	1.28	1.11	1.22	0.74	0.78
Dazhou	1.61	1.77	1.13	0.95	0.63	0.87
Guangyuan	1.44	1.35	1.00	1.19	0.85	0.79
Bazhong	1.84	1.40	0.96	1.30	0.89	0.70
Overall	1.59	1.58	1.08	1.11	0.71	0.80

Data source: Sichuan Statistical Yearbook 2018, Sichuan Statistical Yearbook 2013

3.2.1. Location Quotient Analysis of Primary Industry

On the whole, the location quotient of the primary industry in the urban agglomeration of northeast Sichuan province in 2018 is 1.58, down 0.01 from 1.59 in 2012, and the calculation result is much higher than 1, indicating that the primary industry in the urban agglomeration of northeast Sichuan province has a comparative advantage over the primary industry in Sichuan Province. At the same time, the location quotient of the three industries is compared horizontally, and the value of the location quotient of the primary industry is the largest, indicating that the urban agglomeration in northeast Sichuan is the main agricultural supply region. Although the data of the ratio of industries shows that the secondary industry is the dominant industry in the urban agglomeration in northeast Sichuan province, the primary industry is the most advantageous industry type in northeast Sichuan with good resource endowment of the primary industry.

Meanwhile, from 2012 to 2018, the location quotient of the primary industry of the urban agglomeration in northeast Sichuan basically remained unchanged, indicating that the resource endowment of the primary industry is good and stable. Although the industrial structure has been adjusted in this period, the stability of the location quotient indicates that northeast Sichuan has complete self-sufficiency of the primary industry and can be allocated to other areas in the province. From the analysis of the internal cities, the primary industry location quotient of the five cities is greater than 1, and the change is small from 2012 to 2018. Among them, the primary industry location quotient of Nanchong city and Dazhou City is higher than the other cities, indicating that the two cities have more comparative advantages than the other three cities.

3.2.2. Location Quotient Analysis of the Secondary Industry

From the calculation results of the location quotient of the secondary industry in the northeast Sichuan urban agglomeration, the location quotient in 2018 increased by 0.02 compared with that in 2012, and the calculation result of the urban location quotient in the region fluctuated around 1. The data show that the secondary industry of the urban agglomeration in northeast Sichuan has no comparative advantage compared with the output value of Sichuan province, and can only meet the self-supply within the region. Although the secondary industry is the leading industry of the urban agglomeration in northeast Sichuan province, its location quotient can only reach the average level, indicating that the proportion of the secondary industry should not be blindly reduced to the tertiary industry during the adjustment of industrial structure, and should be adjusted according to the actual situation.

3.2.3. Location Quotient Analysis of Tertiary Industry

By comparing the result of location quotient of the urban agglomeration in northeast Sichuan in 2012 and 2018, it can be found that the location quotient increased by 0.09 from 2012 to 2018, which is the largest increase among the three industries, indicating that the government of the urban agglomeration in northeast Sichuan has an obvious tendency to develop the tertiary industry during the adjustment of industrial structure, but the location quotient is less than 1. That is, it is lower than the average level of the whole province, which also shows that the urban agglomeration in northeast Sichuan does not have the comparative advantage of the tertiary industry, nor does it have the self-sufficiency of the tertiary industry.

The regional comparison shows that Nanchong and Dazhou have the largest growth value of location quotient, indicating that Nanchong and Dazhou pay attention to the upgrading quality of tertiary industry when adjusting and optimizing industrial structure, although they still have no resource advantage in Sichuan province. According to the data of 2012, we can find a phenomenon that the location quotient of Bazhong city and Guangyuan city is the highest in the northeast Sichuan city group. According to the law and trend of industrial structure adjustment, the location quotient of Bazhong City should maintain a certain growth in 2018, but the actual situation is that the location quotient of the tertiary industry in Bazhong city has been declining. It shows that the growth rate of the output value of the tertiary industry in Bazhong city and Guangyuan City is far less than that of the tertiary industry in Sichuan Province. It can be seen that the tertiary industry, as an important industry type conducive to accelerating economic development, improving the quality of national economy and comprehensive national strength, lags behind in the development of the tertiary industry in the urban agglomeration of northeast Sichuan in terms of location quotient and industry proportion, which also leads to the economic collapse of northeast Sichuan.

4. Suggestions on Industrial Development

4.1. Foster Modern Agriculture

From the above analysis can clearly found that the northeast of Sichuan primary industry output value from the province to have certain comparative advantages, the first industry resources endowment ability is strong, able to meet the needs of the region's population lives at the same time, provide to other areas in the province the first industry of finished goods, but it is worth noting that this article only discusses the issues of the size of the primary industry output value, The quality and efficiency of the primary industry are not discussed. Therefore, the urban agglomeration in northeast Sichuan may only have advantages in the output value of the primary industry, but is not capable of more modernized and high-quality development. Therefore, in the research on the development mode of the primary industry of the urban agglomeration in northeast Sichuan, the modernization capacity of its agriculture should be enhanced to achieve high-quality development mode.

At the government level, policies, finance and insurance should be strengthened to ensure the development and consolidation of the advantages of the primary industry by increasing agricultural input and subsidies, improving the support of financial institutions for agriculture, and improving the organization and intensification of production. Enterprises should strengthen cooperation with the government to promote modern intensive agriculture. Urban agglomeration in northeast Sichuan as a traditional agricultural region, the authentic ability of the agricultural industry is insufficient and lagging, enterprises need to develop a benchmark by the government or advantage, give full play to its leading agricultural enterprises, improve the organizational degree of production, to build a city in northeast Sichuan high quality agricultural products business CARDS, make northeast Sichuan area in Sichuan agricultural province play a greater advantage.

4.2. Phasing out Outdated Production Capacity

In terms of the proportion of industry, the secondary industry in the urban agglomeration of northeast Sichuan has the largest proportion, but its location quotient is the smallest. Combining with the actual situation of the urban agglomeration of northeast Sichuan, it can be concluded that the industrial foundation of the urban agglomeration of northeast Sichuan is relatively weak, and there is no dominant or pillar industry. During the six years from 2012 to 2018, the industrial structure of the urban agglomeration in northeast Sichuan has been optimized to a certain extent, in line with the trend of economic development. In view of the existing problems, we should pay equal attention to the rationalization and upgrading of the industrial structure, accelerate the transformation and upgrading of traditional industries, vigorously promote emerging industries and advanced manufacturing industries, and realize the transformation from labor-intensive to technology-intensive industries.

4.3. Vigorously Develop the Service Sector

The development of the tertiary industry in the northeast Sichuan urban agglomeration is particularly backward, with the proportion of the tertiary industry being too small and the degree of industrial specialization low. The development of the tertiary industry in the northeast Sichuan urban agglomeration is also a problem that the Chengdu-Chongqing economic circle is facing except the Chengdu metropolitan circle and Chongqing metropolitan circle. As the core cities of the region, Chengdu and Chongqing have a huge siphon effect on the capital, manpower and market of the surrounding cities, leading to the concentration of many high-quality service industries in Chengdu and Chongqing, which is an inevitable problem in the development.

The government should speed up the cultivation of emerging industries, especially in combination with the background of the Internet, and take advantage of the resource endowment of the urban agglomeration in northeast Sichuan to develop emerging industries and foster new competition points. It is worth noting that in industrial cultivation, it should not only avoid direct competition with the two big markets of Chengdu and Chongqing, but also help the development of the urban agglomeration in northeast Sichuan with the help of the resources of the two markets. At the same time, the government should strengthen the introduction and training of talents, improve the overall development and management level of the tertiary industry. The educational resources of northeast Sichuan city cluster are very backward, the number of universities is small, the quality is not high, and the retention rate of talents is low. The government should find ways to introduce high-quality university resources from Chengdu and Chongqing, and try to establish university research institutes in the cities of northeast Sichuan, so as to improve the shortage of talent supply in the urban agglomeration of northeast Sichuan.

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