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Analysis on Tourism Economic Spatial Relation of Liaoning Central City Group

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Abstract Through the calculation and analysis of the tourism economic spatial relation, it found that Liaoning central urban agglomeration tourism economic spatial relation has many problems, such as the central city is insufficient, and the low degree of spatial relations. Therefore, this article puts forward the countermeasures, which can provide theoretical and practical reference for Liaoning central urban agglomeration tourism industry layout.

Key words Urban agglomeration, Tourism economic space, Liaoning

Urban agglomeration is a product of the development of urbanization development, and is the result of interaction of urban regionalization and region urbanization. Currently, the domestic academic circles do not pay enough attention to the research of urban tourism economic spatial relations, and have less findings^[1-4], but we find that making understanding and the research on urban agglomeration tourism economic spatial relations could make advantages to the optimization of regional tourism resources and production factors of spatial layout, improve the regional economic structure, and properly handle the relations between competition and integration of tourism cities. Liaoning central urban agglomeration is located in the middle of Liaoning province, which includes a vice-provincial city (Shenyang), 6 prefecture-level cities (Anshan, Fushun, Benxi, Yingkou, Liaoyang, Tieling), with a total area of 6.48×10^4 km². It is the fourth largest urban agglomeration. This article makes quantitative research on characteristics of the tourism economic spatial relations of Liaoning central urban agglomeration, and puts forward some countermeasures to strengthen the regulation of the tourism economic spatial relations, thus it can provide theoretical and practical reference for Liaoning central urban agglomeration tourism industry layout.

1 Research method

Analysis on the tourism economic spatial relations is a method with multiple indicators. It uses the economic distance model, the gravity model, and central city field intensity model to measure.

$$\text{Economic distance model}^{[5]}: E = \beta \cdot \alpha \cdot D \quad (1)$$

$$\text{Gravity model}^{[6]}: R_{ij} = \sqrt{P_i V_i} \cdot \sqrt{P_j V_j} / E_{ij}^b \quad (2)$$

$$\text{Central city field intensity model}: C = R/E \quad (3)$$

In the formula: E is the tourism economic distance; D is the

road distance; α and β is correction weight. α is the correction weight of the first time (the correction weight of the commuting distance), its value is determined by transportation conditions between cities. Considering the transportation between cities is "trains and automobiles", so in the model we take $\alpha = 0.7$. β is the correction weight of the second time (the correction weight of tourism economy gap), its values is determined by the per tourism income ratio between the Investigated cities and the central cities). When the ratio is not less than 0.7, it takes $\beta = 0.8$; When the ratio is less than 0.45, it takes $\beta = 1.2$; When the ratio between 0.45 and 0.7, it takes $\beta = 1.0$; P_i and P_j are respectively the total tourists number of tourist city i and tourist city j (the sum of domestic tourism and the number of inbound tourists); V_i and V_j are respectively tourism total income of tourist city i and tourist city j (the sum of domestic tourism income and tourist foreign exchange income). It takes US dollars as the unit of tourist foreign exchange income, which is according to the *Statistical Yearbook*; this article adopts 1:6.2 as the foreign exchange rate); E_{ij} is the economic distance between tourist city i and tourist city j , and b is the index for measuring distance friction effect, according to the experience it usually takes 2; C is the center city field intensity. All the data are from *Liaoning Statistics Yearbook* (2013).

2 Analysis on tourism economic spatial relations

2.1 Tourism economic distance calculation We use formula to calculate tourism economic distance between Liaoning central cities and central city Shenyang.

From Table 1, we can see that the furthest tourism economic distance is between Shenyang and Yingkou, which is 164.64 km; next is the tourism economic distance of Anshan and Tieling, similar with Liaoyang and Benxi, which is about 50 km; the closest distance is Shenyang between Fushun, which is only 33.6 km.

2.2 Calculating the intensity and field intensity of tourism economic relations We use formula (2) and (3) to calculate

the economic relations intensity of various cities in Liaoning central urban agglomerations and the field intensity of Shenyang.

Table 1 Tourism economic distance between Shenyang and Liaoning central cities

	Highway distance km	Per tourism income//yuan	Ratio of per tourism income vs. Shenyang	Correction weight of the commuting distance	Correction weight of tourism economy gap	Tourism economic distance km
Anshan	115	4936.12	0.6855	0.7	1.0	80.5
Fushun	48	4861.4	0.6752	0.7	1.0	33.6
Benxi	77	7740.8	1.0751	0.7	0.8	43.12
Yingkou	196	3093.15	0.4296	0.7	1.2	164.64
Liaoyang	84	8204.48	1.1394	0.7	0.8	47.04
Tieling	73	3154.35	0.4381	0.7	1.2	61.32

Table 2 Tourism economic relations intensity of various Liaoning central cities unit: billion · ten thousand person – time/km²

	Shenyang	Anshan	Fushun	Benxi	Yingkou	Liaoyang	Tieling
Shenyang	–	31.871	146.65	65.583	4.094	41.25	31.578
Anshan	31.871	–	3.534	1.207	3.702	107.31	1.279
Fushun	146.65	3.534	–	5.33	0.575	3.829	10.292
Benxi	65.583	1.207	5.33	–	0.576	13.621	11.363
Yingkou	4.094	3.702	0.575	0.576	–	1.782	0.229
Liaoyang	41.25	107.31	3.829	13.621	1.782	–	1.29
Tieling	31.578	1.279	10.292	11.363	0.229	1.29	–

Table 3 Tourism economic relations intensity- field intensity matrix

C _s	≥100	50 – 100	10 – 50	≤10
≥4	Fushun			
1 – 4		Benxi		
0.5 – 1			Liaoyang, Tieling	
≤0.4			Anshan	Yingkou

From Table 2 and Table 3, we can see clearly that the tourism economic intensity between Shenyang and Fushun is the strongest one, which is 146.65; the second strongest one is between Shenyang and Benxi, which is 65.583. The lower one is between Shenyang and Tieling, which is no more than 50, and among them, the lowest one is between Shenyang and Yingkou, which is only 4.094; it is only 2.79% of the intensity between Shenyang and Fushun. This is weakest one among the six cities. The main reason for this is the far highway distance from Yingkou to Shenyang; it accepts less economic radiation from Shenyang, and combines with its weaker tourism economic power. From the field intensity between Shenyang and other cities, we find that the intensity field strength is closely relative to the intensity of tourism economic relations, the economic relations are greater, the field intensity is stronger; the reverse is also true. From the tourism economic intensity - field intensity matrix, we can find that the city whose intensity is greater than 100, the field intensity is greater than 4 is Fushun; the city whose tourism economic relations intensity is between 50 – 100, field intensity is between 1 – 4 is Benxi; the two cities whose tourism economic relations intensity is between 10 to 50, field intensity is between 0.5 – 1 is Liaoyang and Tieling; the city whose tourism economic relations intensity is less than 10, field strength is less than 0.4 is Yingkou. From the

grade distribution, most of the urban economy relations' intensity is between 10 – 100, field intensity is between 0.5 – 4, only the tourism economic intensity and field intensity of Fushun and Yingkou appears strong polarization phenomenon.

3 Recommendations

According to the above measurement and analysis, it shows that currently Liaoning central urban agglomeration is not strong enough, whose spatial relations level is low. Therefore, it provides recommendations as follows:

3.1 Strengthening the leading role of Shenyang and fostering new growth pole

It should strengthen the centrality of the leading role of Shenyang the. Overall, urban economic strength, the city scale, the strength of the attraction, and effects on cities in the region, Shenyang has played the "engine" role in the process of urban agglomeration development. Therefore, the basic reason should be attributed to the agglomerate economy effect that is the unique characteristic of big cities. Thompson points out that the city should have a moderate scale (in order to achieve economies of scale), which can increase when the it is above the designated size, while the economic recession, it could not happen. This is the big city's unique "Ratchet Effect." So that Liaoning central urban agglomeration should further accelerate the speed of polarization effect in Shenyang, through the industrial agglomeration to strengthen its core position, and making it to become the radiation center of the rapid development. Anshan and Yingkou should be cultivated as the new growth pole of the urban agglomeration. The reason is that they are matching the development steps of Liaoning central urban agglomeration; even further the future development of Liaoning province. The choice of the growth pole

should comprehensively consider the urban population scale, the economic scale, and the future development potential. Both Anshan and Fushun have the larger population scale and better the economic strength. Due to the spatial distance between Fushun and Shenyang is very close, and the two cities' built-up areas relatively develop, nearly connected together. It is obviously that Shenyang and Fushun will be urban integration; in the near future, the two cities will integrate into one city. Therefore, cultivating Anshan to be the new growth pole is the very realistic choice. Yingkou's economy has developed rapidly in recent years; especially the Yingkou Port construction makes very important effect on the economic development of Liaoning province, the Northeast China Region, even the Eastern Inner Mongolia Region. The establishment of Yingkou 100 million tons big port will greatly shorten the distance to sea of Shenyang, the Northeast China Region, and the Eastern Inner Mongolia Region. Strengthening the economic relations to Yingkou could establish the "dual-core" development model of the urban agglomeration.

3.2 Establishing "One Hour" tourism transportation circle

It should accelerate the establishment of Shenyang Highway Network; make all efforts to build the "One Network, Two Rings, Six Coverages," the main structure of the highway, which takes the center of Shenyang in the Liaoning central cities. Speedily developing the intercity traffic between Shenyang to Anshan, to Fushun, to Benxi, to Yingkou, to Liaoyang, and to Tieling will realize the arrival time from Shenyang to the six cities within one hour, which build "Big Shenyang One Hour Tourism Transportation Circle." It takes Shenyang as the center to accelerate the in-

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and it integrates several development models. On the premise of ecological protection and culture protection, Yi County maximizes its rural tourism resources, and fully realizes the economic benefits, social benefits, and environmental benefits.

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ter-city rail transit construction in urban agglomeration. It should break the regional blockade and local protection, reduce the inter-city highway toll station, especially the urban entrance toll station to realize transportation accessibility in urban agglomeration; it should develop vehicle rescue integration and the car rental market integration; it should expand Taoxian International Airport to enhance the relations of Shenyang to domestic and abroad central cities; it should speed up the construction of Yingkou 100 million tons big port to shorten the distance to sea of Shenyang, the Northeast China Region, and even the Eastern Inner Mongolia Region, which could strengthen the connection with domestic and foreign important ports, and Liaoning central urban agglomeration could open wider to the outside.

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