Analysis on Spatial Pattern of Financial Service Facilities and Tourist Reception Facilities in Hohhot Central Urban Area

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Abstract: With the development of urban tourism, tourists become one of service objects of urban financial facilities and infuse new vitality for the development of urban financial industry. This paper takes the tourist city Hohhot for example and adopts standard deviational ellipse method and nearest neighbor analysis to analyze spatial distribution pattern of self-service banks and tourist reception facilities. The analysis results show that in the research field, spatial distribution pattern of self-service banks has very strong agglomeration feature. Spatial agglomeration of economical hotels is similar to that of self-service banks, but agglomeration of middle and high star-level hotels is not obvious, presenting spatial pattern of random distribution. The scenic spots mainly concentrate in southwestern region of the city. Thus, urban tourist consumption service supply system oriented to tourist demand in which the government, market and enterprises participate should be constructed.

1. Introduction

Self-service banks are convenient service windows which are set up to meet financial service demand of local residents and various units. Take Hohhot City for example. According to the author's survey in Hohhot, although e-payment development provides convenience for tourist consumption, tourists still have different degree of small and convenient banking activities. Especially in tourist consumption, the proportion of consumer financial services will increase. Besides, middle-aged and senior people as an important constituent part of tourists lag behind in understanding and operation of e-payment. So, self-service banks will still work in the future period. Banks should pay attention to consumer financial services for tourists and regard tourists as a group of financial activities of tourist cities. In addition, with social development and improvement of tourist level, tourists' attention to tourist cities is no longer only confined to tourism resource richness, but also focuses on the level and quality of services provided by tourist cities. Thus, it is required to expand the perspective of urban tourism services, integrate consumer financial services provided by banks to tourist consumption services and enrich research content of tourist consumption services.

2. Data sources and research methods

2.1 Research area

Hohhot City is a capital city of the Nei Monggol Autonomous Region and also "excellent tourist city in China". With a long history and abundant humanistic and cultural tourism resources, Hohhot City attracts lots of tourists. Thus, tourist reception facilities within the urban area are extensively distributed, and other all kinds of tourism infrastructure construction also become the urban planning emphasis. This paper chooses Hohhot central urban area as the research area, including the area within the Second Ring Road, area along the line, Ruyi Development Zone and Jinqiao Development Zone. This space range covers historical urban area and main new urban area of Hohhot City, and it is mostly concentrated area of population, economy, hotels, and scenic areas in the whole city.

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2.2 Data sources

At present, domestic self-service banks deem ATM and CDT as the main operation patterns. The self-service banks in the research area include four categories: large-scale commercial banks, joint-equity commercial banks, city commercial banks and postal savings banks. There are 16 banks and 553 outlets in total. The bank outlet data come from banks' official websites. Spatial distribution of tourists is mainly reflected through spatial data of hotels and scenic areas in the research area. The base map of ArcGIS analysis comes from 2016 Urban Map of Hohhot Central Urban Area (scale: 1:150,000). ArcGIS10.0 software is used for vectorization of the map (Xi'an 1980 geodetic coordinate system projection).

2.3 Research method

2.3.1 Standard deviational ellipse method

Spatial distribution of geographical phenomenon owns discreteness and directivity. Spatial distribution of different geographical phenomena is different, and discreteness and directivity also differ. Standard deviational ellipse method, based on point mode, is a visual and effective way to disclose spatial distribution discreteness and directivity of geographical phenomenon. Standard deviational ellipse is mainly composed of 3 elements, namely, corner θ, standard deviation along the long axis and standard deviation along the minor axis. Corner θ is the included angle between the north direction gained after the long axis and minor axis rotates along certain angle according to geographic orientation of point element distribution, and the long axis rotating clockwise. The long axis presents the main distribution direction of self-service banks, hotels and scenic areas, while the minor axis refers to the minimum distribution direction of these geographical phenomena. The area of ellipse represents the dispersion degree of geographical phenomena.

2.3.2 Nearest neighbor analysis

Nearest neighbor analysis is an important part of point mode analysis, and was first proposed by two ecologists Clark and Evans to analyze population distribution pattern. Later, Pinder and Ebdon improved the mode to make it a mature method to analyze dot-shaped spatial distribution pattern. Nearest neighbor analysis measures Euclidean distance between each point element and its closest adjacent point so as to solve the average value, i.e. practical average nearest neighbor distance.

3. Result analysis

3.1 Spatial distribution pattern of self-service banks

The distribution of 553 self-service banks in Hohhot central urban area is shown in Fig.1. Self-service banks mostly concentrate in the east of Tongdao Road, west of the Second Ring Road, south of Hailar Street and north of Ordos Street. Except central urban area, self-service bank concentration area also exists near Ruyi Plaza in the east of the city and southward extending area of Zhaowuda Road, while only scattered self-service banks exist in the east of West Second Ring Road, west of Bayannur Road, south of North Second Ring Road and north of South Second Ring Road. Seeing from standard deviational ellipse, the center of self-service banks is located at 111.700°E, 40.827°N, i.e. 120m in the east of intersection between Zhaowuda Road and Ulanqab West Street, around which main colleges, provincial hospitals and emerging shopping malls in Hohhot City. Thus, it is a place where the population is concentrated and city environment is superior. Based on Level 1 standard deviation, about 68% of barycenters of self-service banks are contained in the ellipse, which can well reflect distribution characteristics of bank elements. When the direction angle of ellipse is 72.374°, the specific value of long and short radius reaches the peak, and the short radius at northwest-southeast direction in the ellipse is obviously shorter than the long radium at northeast-southwest direction, indicating that bank elements present obvious distribution trend along

Xinhua Street to northeast-southwest direction. Besides, the centripetal force of bank elements is significant. Dispersion degree among elements is low, and agglomeration degree is high.

Legend
Self-service banks
County highway
Main roads in central urban area
Standard deviation ellipse

Fig.1 Distribution of self-service banks in Hohhot central urban area

To further investigate spatial agglomeration degree of self-service banks, the author introduced nearest neighbor analysis. The average nearest neighbor rate of all self-service banks is 0.371694 (Table 1). R value is smaller than 1 and close to 0, indicating that agglomeration degree of self-service banks in Hohhot central urban area is high. This further verifies bank elements present obvious trend of agglomeration along Xinhua Street to northeast-southwest direction.

Table.1 Analysis results of average nearest neighbor of self-service banks

Summarization of average nearest neighbor elements	
Average viewing distance	189.3061
Expected mean distance	509.2745
Nearest neighbor rate	0.371694
Z score	-28.266012
P value	0.000000

3.2 Spatial distribution pattern of tourist reception facilities

Tourist distention in the city is closely related to their hotel accommodation behaviors and scenic area visit behaviors, while tourists' economic behaviors also mainly happen near hotels and scenic areas. So, the author indirectly reflected spatial distribution pattern of tourists' economic behaviors through collecting hotel and scenic area distribution of Hohhot central urban area.

The distribution of 829 hotels in Hohhot central urban area is shown in Fig.2. The concentrated hotel distribution area is the east of Bayannur Road, west of Khorchin Expressway, south of North Second Ring Road and north of South Second Ring Road. In addition to this area, hotel concentration area also exists near East Railway Station, in Jinqiao Development Zone and southward extending area of Zhaojun Road (near Yuquan District Government and Inner Mongolia University South Campus). Hotel distribution is scattered in the west area of the city (the area in the west of Bayannur Road), and the concentration state does not form. Since tourists have different choices, their demands for hotels also differ. To compare distribution state of different tourists, the author classified the hotels into economical hotels and high star-level hotels, and carried out standard deviation ellipse analysis for the two categories of hotels. The barycenters of economical hotels and high star-level hotels are at 111.690°E, 40.825°N and 111.699°E, 40.826°N, respectively, and the barycenters of two kinds of hotels most coincide. Both are near Manduhai Park, but long and shot radius and rotation angles of two ellipses are inconsistent. When standard deviation ellipse of economical hotels rotate 70.716°, the ratio of long and shot radius is maximum and the specific value of long and minor axis reaches 2.00, demonstrating that short radius at northwest-southeast direction in the ellipse is obviously shorter than the long radius at northeast-southwest direction. The elements of economical hotels show obvious trend of distribution along Xinhua Street to northeast-southwest direction, And, the centripetal force of economical hotel elements is obvious. Besides, dispersion degree among elements is low, and agglomeration degree is high. When standard deviation ellipse of middle and high star-level hotels rotates 98.396°, the ratio of long and shot radius is maximum and the specific value of long and minor axis reaches 1.45, demonstrating that the difference value between long radius at northwest-southeast direction in the ellipse and short radius at northeast- southwest is not obvious. Middle and high star-level hotel elements show the trend of distribution along the

northwest- southeast direction of Xing'an Road. But, the centripetal force is not obvious, and agglomeration degree among elements is low.

The nearest neighbor analysis of economical hotels shows (Table 2), the rate of nearest neighbor is 0.366533. R value is less than 1, and close to 1, indicating that agglomeration degree of economical hotels in Hohhot central urban area is high. This further verifies the elements of economical hotels present significant trend of agglomeration along Xinhua Street to northeast-southwest direction. The nearest neighbor analysis of middle and high star-level hotels indicates that (Table 2), the rate of nearest neighbor is 0.805762, and R value is close to 1, demonstrating that compared with the distribution of economical hotels, agglomeration degree of middle and high star-level hotels in Hohhot central urban area is not obvious, and presents random distribution trend.

Legend
Economical hotels
Middle and high star-level hotels
County highway
Main roads in central urban area
Standard deviation ellipse of middle and high star-level hotels
Standard deviation ellipse of economical hotels

Fig.2 Distribution of hotels in Hohhot central urban area

Table.2 Analysis results of average nearest neighbor of Hotels

Summarization of average nearest neighbor elements		
	Economical hotels	Middle and high star-level hotels
Average viewing distance	147.600	682.114
Expected mean distance	402.831	846.672
Nearest neighbor rate	0.366533	0.805762
Z score	-31.251112	-3.602703
P value	0.000000	0.000315

Since standard deviation ellipse method requires at least 30 elements to be input, while there are only 13 scenic spots in Hohhot central urban area. So, standard deviation ellipse analysis is not applicable. The scenic spots in Hohhot central urban area mainly concentrate in the long and narrow area which is located in the east of Tongdao Road, west of Hulun Buir Road, south of Hailar Street and north of Ordos Street. The area belongs to the scope of Yuquan District, because the central urban area of Hohhot experienced era changes, and a lot of historic and cultural sites are left. There are only scattered scenic spots in the east of Xingan Road, west of Khorchin Expressway, south of North Second ring Road and north of East Second Ring Road, and the dispersion degree of scenic spots is high.

4. Suggestions

From the analysis of spatial distribution pattern of self-service banks, hotels and scenic areas in Hohhot central urban area, it can be seen that, spatial distribution pattern of self-service banks in the research area presents the trend of extension along northeast-southwest direction of Xinhua Street. Besides, the centripetal force of banks is obvious, and there is very strong aggregation feature. Spatial agglomeration of economical hotels is similar to that of self-service banks, but agglomeration of middle and high star-level hotels is not obvious, presenting spatial pattern of random distribution. The scenic spots are mainly distributed in the southwestern region of the city, because Yuquan District is the earliest area in the history of Hohhot, and a lot of historical and cultural sites are left.

5. Conclusion

To improve financial service function of tourist consumption in Hohhot City, urban tourist consumption service supply system oriented to tourist demand in which the government, market and enterprises participate should be constructed. Government participation can provide policy support for tourist consumption service system, while market orientation function is the guarantee for tourist consumption system to exist long. Enterprise participation can ensure maximization of tourist consumption system. The establishment of tourist consumption service supply system can create more convenient and comfortable tourist environment for tourists and meet tourists' consumption demand in the travelling process.

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