Measurement and Analysis of Social Integration of Floating Population

Shuwei Chen[1,a] Jingfeng Zhao[2,b] and Zhaoan Han[3,c]

[1]Research Center of Western China's Economic Development, Northwest University, shaanxi, xi 'an,China

[2]Research Center of Western China's Economic Development, Northwest University, shaanxi, xi 'an,China

[3]School of Economics & Management, Northwest University, Xi'an China

[a]shuweichen@126.com,[b]171545892@qq.com, [c]790833409@qq.com

Abstract. In recent years, the floating population has become an important population effect on our country's urbanization, the floating population in the city's social alignment more can directly reflect a city's development potential and resistance. Through constructing social integration evaluation system, measuring urban social alignment model is established, and through the principal component analysis (pca) to explore the main factors influencing the social integration, through the analysis, the economic situation of the floating population, social status, housing situation and the working distance is the main factor affecting the social integration.

Introduction

"Social integration" is a dynamic, gradual, multi-dimensional, interactive concept[1], which is a comprehensive and challenging concept, and not only has one dimension or meaning[2]. Therefore, the measurement of social integration of floating population is by no means a single indicator or a single dimension. According to the statistics, the number of floating population in China reached 245 million in 2016, the floating population in the city's economic income of migration and education situation and psychological identity, social integration condition directly affects the urban construction, urban management, etc. This paper aims to construct a comprehensive social integration system to measure the social integration of urban floating population in order to provide reference for urban management.

Literature review

Foreign theory. Social integration theory can be divided into traditional social integration theory and non-traditional social integration theory. The former is proposed by Park (1928)[3] and developed by Milton Gordon (1964) [4] as the classical social integration theory. Their main point is that migrations are targeted by the "middle class" in the local society. The non-traditional integration theories include: multiculturalism, regional integration theory, linear fusion theory, curvilinear theory, residence fusion theory, etc.[5,6,7]. Traditional and non-traditional theory main difference is that the former think of the floating population to the "middle class", while the latter thinks the result of the social integration is diverse, "middle class" is not the only standard.

The measurement of social integration abroad. Milton Gordon advocated measuring social integration from seven levels: the assimilation of culture or behavior; Mutual infiltration or integration of social institutions; Interracial marriage; Integration of ethnic group consciousness or identity; The elimination of ethnic prejudice in the consciousness of consciousness; The elimination of discrimination in the economic, employment and education areas of the ethnic group; The fusion of public affairs in public[8].

Theoretical research and measurement dimensions of domestic social integration. At present, the theoretical study of social integration in China is still mainly reference to the theoretical system of foreign countries, which includes the theoretical framework of American sociology, such

as: ren yuan, wu min le (2006); Zhang wenhong, lei kaichun (2008); Yang ju (2009); Yue zhongshan et al. (2009) also draws on the European sociological analysis framework, especially from the perspective of social integration or isolation (garrida, huang kuang, 2009). Under different theoretical framework, the definition of social integration is different. In contrast, domestic theoretical research is still weak.

Construct Social Integration Measurement Model

Index system. Based on the existing research, this paper improves the evaluation system and increases the relevant dimensions. From the economic integration, social integration and psychological integration, system integration and fusion of five dimensions of social space alignment measurement, respectively below contains a number of dimensions of five dimensions, dimensions of below contains a number of indicators, the concrete index system are shown in Table 1.

Table 1 Social integration measurement system

The main dimensions	Dimensions	Specific indicators
Economic integration	Income	The proportion of the income of local urban workers
		Average monthly statement balance
		Income versus house prices
	Working strength	Average working hours per month
	Job stability	The percentage of people who have changed their job experience
		The average length of each job
Social integration	Family relocation	Married couples are together
		Having children with children
	Settling time	The length of the current residence
	Socialize with local society	The number of local friends who travel frequently
	Adaptability to local life	Can you communicate in the local language
		Get used to local life
Psychological fusion	Identity of local identity	If you want to settle down and feel yourself
		The status gap with the local population
	The degree of recognition of local society	Whether or not the local residents behave in the same way
		Get on well with local residents
System integration	The social security	Is there a local five risk
	Housing accumulation fund	Whether to enjoy the local housing provident fund
Space fusion	Live	Living in the form of
		The number of times to change a home
	Travel	Way to travel
		The distance to the workplace

Because some indicators cannot be quantified, such as the way of travel, we have prepared alternative options such as: electric vehicle for 1; The bus is 2; The subway is 3; Drive yourself to 4. Similarly, other indicators that cannot be quantified take this approach for data collection。

Data processing. Due to the differences in the positive and negative orientation, dimensionality and order magnitude of each system index, the raw data of each index needs to be standardized and normalized. The positive indicators are standardized with Eq.1, and the reverse index is standardized with Eq.2。

$$m_{xy} = \frac{k_{xy} - \min(k_{xy})}{\max(k_{xy}) - \min(k_{xy})} \qquad (1)$$

$$m_{xy} = \frac{\max(k_{xy}) - k_{xy}}{\max(k_{xy}) - \min(k_{xy})} \qquad (2)$$

m_{xy} （x=1,2;y=1,2,…,n）, index of indicators for standardized treatment，k_{xy} the original sample value of the y item below the x system，$\max(k_{xy})$ the maximum value of the series，$\min(k_{xy})$ is the minimum value for the series.

Determine index weight. The index weight calculation method can be divided into two categories: subjective empowerment and objective weighting method. Subjective law relies on expert experience and existing knowledge to determine the importance of index, which is highly subjective, and the five-level scale valuation method is a typical subjective weighting method. Entropy method is an effective objective weight method, which determines the weight of each index through the calculation of raw data. The entropy method is adopted to determine the weight of each index[9], and the process is as follows:

Calculate the proportion of the y item in the x system S_{xy}:

$$S_{xy} = k_{xy} / \sum_{y=1}^{n} k_{xy}$$

Calculate the entropy of the y term h_y:

$$h_y = -\frac{1}{\ln n} \times \sum_{y=1}^{n} (S_{xy} \times \ln S_{xy})$$

Calculate the difference of t_y according to the entropy value of h_y

$$t_y = 1 - t_y$$

Weight of calculation indicators:

$$d_y = t_y / \sum_{y=1}^{n} t_y$$

Calculate social integration. According to the index weight and the index index after standardization, calculate the social harmony of the city:

$$Z_x = \sum_{y=1}^{n} d_{xy} m_{xy} \quad \sum_{y=1}^{n} d_{xy} = 1$$

Analysis of principal component of urban social integration

In this paper, principal component analysis is used to analyze the main components of the selected indexes in this paper, and the main factors influencing social integration are explored. Using the oblique rotation method to explain the actual meaning of the factors, the factors that affect the main components are obtained. In order to achieve the purpose of simplifying the data, according to certain rules to extract the characteristic value is higher, to explain the original data information variance contribution rate higher (generally not be less than 85%) of several principal components shall be maintained. The model of the principal component factor is defined as:

$$G_i = C_{i1}X_1 + C_{i2}X_2 + \cdots \ldots + C_{ij}X_k \quad (i = 1,2 \ldots \ldots, m)$$

G_i is the principal component factor of i; C_{i1} is the load on the JTH index for the ith principal component factor; m is the number of principal component factors extracted; K is the number of indicators. K = 30. Using Stata software to carry on the principal component analysis, correlation coefficient matrix, the calculated standardized data characteristic roots and characteristic vectors, variance contribution rate, principal component load, you can see from table 2, the five principal components of the cumulative contribution rate has reached 100%. Using principal component G_1, G_2, G_3, G_4, G_5 represent the original 30 degree of indexes for evaluating urban into, can fully express all index information, and the five principal components uncorrelated, thus avoiding the evaluation index information repeated problems. The results are shown in Table 2.

Table 2 Analysis of variance contribution

The principal components	Eigenvalue	Unrotatable contribution rate	Accumulated contribution rate	Eigenvalue	The contribution rate after rotation	Accumulated contribution rate
G_1	9.83487	0.3871	0.3091	7.8562	0.2433	0.2613
G_2	6.75693	0.2764	0.5544	6.4433	0.2149	0.4763
G_3	5.18728	0.1345	0.7329	5.8099	0.1961	0.6723
G_4	4.67612	0.1234	0.8544	5.2120	0.1230	0.8484
G_5	3.6678	0.1656	1.0000	4.5656	0.1786	1.0000

The rotated principal component analysis shows that the first principal component contribution rate reached 26.13%, the largest is the most important factor, the influence of the first principal component load coefficient of the absolute value of more than 0.9 evaluation index and income and housing prices than, main feel than low status, local residents enjoy medical insurance three; The contribution rate of the second principal component was 21.49%, and the load factor exceeded 0.9. The third principal component includes the participation of the housing provident fund and the two indicators from the residence to the working area within 10 minutes; The average monthly balance of the fourth principal component; The fifth principal component includes the proportion of living quarters.

Different cities have different characteristics or personalities that will affect the newly entered population. The formation of a city's character is not just limited to the exterior appearance and the present state of environment, more important is determined by the city's economic, social and cultural, not only including physical factors, including human factors. It has the characteristic factors which are determined by the conditions such as the specific natural geographical environment, and also the characteristic factors determined by the socio-economic and cultural aspects. The urban integration of floating population is the interactive process between floating population and local society. The influence of urban characteristics on urban integration of floating population is reflected in two aspects. On the one hand, the unique character of the city has some effect on the floating population, including positive and negative effects. The positive effect can bring the floating population closer to the city, acquire the recognition of the city, and create a sense of affinity and pride, which is conducive to the effective integration of the floating population. The negative effect has the exclusion effect, which makes the foreign population feel alienated and has low recognition of the city, which is not conducive to the integration of the population. On the other hand, the influence of urban characteristics on floating population characteristics lies in its selection mechanism. Different cities attract different floating population.

Conclusion

In this paper, the social integration measurement model is established by constructing the social integration system of urban floating population, and the model can be used to manage the urban

floating population effectively. The main influencing factors that influence social integration are determined by the principal component analysis, which provides the basis for the urban improvement of the social integration of floating population.

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