

Exploring the development path of equalization of basic public services in Chengdu-Chongqing twin-city economic circle

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Abstract: *This paper selects the data of each city and district and county in Chengdu-Chongqing twin-city economic circle from 2012 to 2020, constructs the index system of equalization of basic public services, and uses the Thiel index to measure the level of basic public services for five primary indicators and several secondary indicators in Chengdu-Chongqing twin-city economic circle, and the results show that: (1) The level of equalization of basic public services in Chengdu-chongqing economic circle is in a "Good" stage. (2) The degree of inequality of basic public services of social security, medical and health care, and education and culture in the total region is increasing year by year. (3) The differences in the equalization of basic public services between regions are most prominent in the deepening of the inequality of basic public services in social security and infrastructure year by year. This paper then analyzes the characteristics and causes of the unequalization of basic public services in the Chengdu-Chongqing twin-city economic circle and proposes policy recommendations for the future development path.*

Keywords: *Chengdu-Chongqing twin-city economic circle; equalization of basic public services; Thiel index*

1. Introduction

Equalization of basic public services refers to the need for local governments to provide products and services that can meet the common needs of all members of the local community in a roughly equal manner and ensure relative fairness and equity. "Parity" includes two meanings: first, equality of rights and opportunities in the enjoyment of public services, and second, the idea of bottom-line fairness, including that the most disadvantaged groups can also enjoy the basic public services provided by the state.^[1] Due to the differences in geographical location, beneficiary scope and financial level of local governments at all levels in the Chengdu-Chongqing twin-city economic circle, non-equalization of basic public services between regions, cities and rural areas and citizens can occur. The study on the equalization of basic public services between regions in the Chengdu-Chongqing twin-city economic circle is the most important thing to ensure the low-cost decentralization, high-efficiency undertaking, interconnection and development, and synergistic progress in the region.

2. Review of Literature

Foreign research on basic public services is early, and it first originated from British scholars in concluding fiscal federalism, expecting to solve the problem of public expenditure transfer through the combination of equity and efficiency.^[2] In the 1880s, Wagner proposed the concept of basic public services, which should be an important component of local government transfer expenditure foreign research on public services Most foreign studies on public services have focused on a particular area, especially on public services for special groups^[3] Scholars such as Simson Rebecca have focused on racial inequality and discrimination in public services;^[4] Shankor Paul and M. Rezaul Islam have studied the depth and accessibility of public services at the bottom based on the poorest groups in Bangladesh.^[5] Scholars assess the equity and responsiveness of public services using the example of the education of Tunisian children. Research on the equalization of basic public services in China started late, and current studies focus on the construction of indicator systems for the equalization of basic public services, the measurement of the degree of inequality, and future breakthrough paths. For example, Lin Yangyan constructed an evaluation system for the equalization of basic public services in China by selecting four primary indicators, including basic education, basic health care, environmental

protection and infrastructure^[6] Based on the data of 21 prefecture-level cities in Guangdong Province, Shao Yanfei et al. measured the level of basic public services in Guangdong Province by constructing five first-level indicators of education and culture, health care, infrastructure, transportation, post and telecommunications, and social security.^[7] Qi Xuexiang established six second-level indicators and 33 third-level indicators based on the level of service development and the difference of equalization in Sichuan Province, and applied the difference coefficient method and the comprehensive evaluation method to measure the level of basic public services in Sichuan Province, China. The level of public services is quantified.^[8]

Existing domestic and international studies on the equalization of basic public services have focused more on a certain service area or a single administrative region. Basic public services are not only the rights available to urban and rural residents in the household registration area, but also the roughly equal public services that can be owned across administrative regions and across urban areas. By dividing the country into three regions, namely the eastern, central and western regions, and setting three indicators for basic education, public health care and social security to study the level of equalization of basic public services across the country, Tang Tianwei found that the level of basic public services varies greatly among regions in China, especially in two areas: the level of health care and the level of social security.^[9] Based on the data of 21 prefecture-level cities in Guangdong Province, Shao Yanfei measured the level of basic services in Guangdong Province from five primary indicators, including education and culture, health and medical care, social security, transportation, post and telecommunications, and infrastructure, and set several secondary indicators under each primary indicator, and studied the spatial differences. This paper will quantify the equalization of public services in Chengdu-Chongqing economic circle from the following indicators (Table 1):

Table 1: Index system of equalization of basic public services in Chengdu-Chongqing twin-city economic circle

Level 1 Indicators	Level 2 Indicators
Education Culture	Number of public libraries (number); public library collection (million books); number of elementary and middle school students in school (number); number of elementary and middle school teachers in school (number); radio coverage (%); TV coverage (%)
Health Care	Number of health technicians (persons); number of occupational physicians (persons), number of beds (persons); number of medical and health institutions (persons); number of registered nurse practitioners and nurses (persons)
Social Security	Number of urban and rural participants in medical insurance (people); unemployment insurance (people); basic pension insurance (people); urban minimum living security (people)
Infrastructure	Number of graded road miles (km), total postal and telecommunications services (RMB million); number of local fixed telephones (households); number of local mobile telephones (households)
Ecology	Domestic sewage treatment rate (%); green area coverage in built-up areas (%); domestic waste disposal rate (%); regional urbanization rate (%)

3. Data sources and research methods

3.1. Research objects

The major cities involved in the Chengdu-Chongqing twin-city economic circle are 12 prefectures in Sichuan Province, including Chengdu, Mianyang, Deyang, Meishan, Ya'an, Leshan, Suining, Nanchong, Neijiang, Ziyang, Zigong and Dazhou, and 13 counties in Chongqing, including Tongnan, Tongliang, Hechuan, Chongqing main urban area, Rongchang, Dazu, Yongchuan, Bishan, Guang'an, Dianjiang, Liangping, Kaixian and Wanzhou. Among them, the main urban area of Chongqing is Yuzhong District, Jiangbei District, Nan'an District, Jiulongpo District, Shapingba District, Dadukou District, Beibei District, Yubei District, Banan District and other nine central urban areas.

3.2. Data source

The data come from the 2012-2020 China City Statistical Yearbook, the 2012-2020 Sichuan Provincial Statistical Yearbook, the statistical yearbooks and statistical bulletins published by each

prefecture-level city in Sichuan Province, the 2012-2020 Chongqing Municipal Statistical Yearbook, and the statistical yearbooks and statistical bulletins published by each district and county in Chongqing, as well as the EPSDATA database.

3.3. Research Methodology

In this paper, the Thiel index will be chosen as a method to measure the level of equalization of basic public services. The Thiel index was proposed by Theil and other scholars in 1967. The Thiel index or Thiel entropy is famous for its clever use of the entropy principle in information theory to calculate income inequality, and it is of great reference significance for studying the level of regional economic development and the level of income distribution.

$$T = \sum_{i=1}^{n=25} \left\{ y_i \lg \left(\frac{y_i}{P_i} \right) \right\} \quad (1)$$

The other is the Thiel L-index, which is weighted mainly according to the regional population share, with the formula:

$$L = \sum_{i=1}^{n=25} \left\{ P_i \lg \left(\frac{P_i}{y_i} \right) \right\} \quad (2)$$

Where n is the number of each region in the Chengdu-Chongqing Economic Circle, y_i is the proportion of each region's fiscal revenue to the total region (the sum of all the requested regions), and P_i is the resident population of each region to the resident population of the total region (the sum of the population of all the requested regions). The Thiel index is greater than 0. The larger the index, the larger the gap, and the smaller the index, the smaller the gap.

Taking income as an example, the general expression of the Thiel index can be organized as the following formula (Equation 3), through which the calculation of the total regional Thiel index will be carried out in this paper, using the weighted average method to assign the same weight to each secondary indicator:

$$T = \frac{1}{n} \sum_{n=1}^n \frac{D_i}{D} \log \left(\frac{D_i}{D} \right) \quad (3)$$

The Thiel index has a decomposable nature, and the sample can be divided into multiple groups for the measurement of intra-group disparity and inter-group disparity when conducting descriptive statistics. In this paper, we select the data of Chengdu-Chongqing twin-city economic circle, which includes 13 prefecture-level cities in Sichuan Province and 12 districts and counties in Chongqing, so this paper will first classify the 13 prefecture-level cities in Sichuan Province and 12 districts and counties in Chongqing into treatment groups:

$$T = T_b + T_w = \sum_{k=1}^K D_k \log \frac{D_k}{nk/n} + \sum_{k=1}^K y_k \left(\sum_{i \in gk} \frac{D_i}{D_k} \log \frac{D_i/D_k}{1/n_k} \right)$$

$$T_b = \sum_{k=1}^k D_k \log \frac{D_k}{n_k / n}$$

$$T_w = \sum_{i \in gk} \frac{D_i}{D_k} \log \frac{D_i / D_k}{1 / n_k}$$

“ T_b ” represents the difference of the Thiel index of each region among the four regions of Chengdu-Chongqing, and “ T_w ” represents the difference of the Thiel index of each region within the four regions of Chengdu-Chongqing. “ k ” is the number of regions divided within each region, “ y_k ” indicates the ratio of the difference of the Thiel index of the “ k ”th region to the difference of the total region, and “ n_k ” indicates the number of cities or districts and counties within the “ k ”th region, each group is “ gk ”, ($k=1, 2, 3...$) respectively, this paper will calculate the Thiel index inter-group disparity by T_b for the four regions divided by Chengdu-Chongqing twin-city economic circle.

4. Analysis of the results of measuring the level of equalization of basic public services in the Chengdu-Chongqing twin-city economic circle

Table 2: Overall measurement of each indicator of the level of equalization of basic public services in the Chengdu-Chongqing twin-city economic circle

Year	Education Culture	Health Care	Social Security	Infrastructure	Ecology
2012	0.2848	0.3684	0.3868	0.5137	0.0345
2013	0.2763	0.3696	0.3904	0.5082	0.0348
2014	0.2752	0.3712	0.3941	0.4896	0.0315
2015	0.2766	0.3754	0.4016	0.4803	0.0321
2016	0.2798	0.3856	0.3971	0.4705	0.0278
2017	0.2901	0.3852	0.3916	0.4668	0.0278
2018	0.3294	0.4269	0.4042	0.4693	0.0230
2019	0.3226	0.4303	0.4180	0.4545	0.0209
2020	0.3252	0.4328	0.4249	0.4521	0.0194

The level of equalization of basic public services in the Chengdu-Chongqing twin-city economic zone is generally at the "good" stage, with the degree of inequality of basic public services in the total region increasing year by year, especially in education and culture, health care and social security indicators. According to equation (3), this paper calculates the Thiel index of basic public service parity in Chengdu-Chongqing twin-city economic circle from 2012 to 2020 (as shown in Table 2), and finds that the level of basic public service parity in Chengdu-Chongqing twin-city economic circle increases year by year in three aspects of education and culture, health care and social security, and gradually decreases in two aspects of infrastructure and ecological environment.

The differences in the equalization of basic public services among the regions of Chengdu-Chongqing twin-city economic circle are most prominent in the deepening of the inequality of basic public services in social security and infrastructure. The large changes in the Thiel coefficient disparity are in social security and infrastructure indicators. The difference in Thiel index for social security indicators increases from 0.1943 in 2012 to 0.2742 in 2020, and the percentage of disparity increases from 50.24% to 64.53%. The Thiel indexes of education and culture, health and medical care, and ecological environment, as well as the proportion of the total regional gap, are decreasing year by year, and the proportion of the three indicators will be 43.38%, 48.62% and 60.34% respectively by 2020. By 2020, the inter-regional Thiel indexes with a higher proportion of the total regional disparity are social security, infrastructure, and ecological environment, with 65.53%, 65.25%, and 60.34% in 2020. The inter-regional Thiel indexes and their proportion of the total regional disparity exceed 50%, which means that the degree of inequality in the level of basic public services varies greatly between regions

5. Conclusions and discussion

5.1. Conclusions

The level of equalization of basic public services in Chengdu-Chongqing twin-city economic circle is influenced by various aspects such as politics, economy, society and culture, etc. The degree of inequality of each indicator can be ranked from largest to smallest as follows: infrastructure > social security > medical and health > education and culture > ecological environment.

Transform the basic functions of local governments and create a "service-oriented" pro-people government with the equalization of basic public services as its core. Local governments need to increase financial transfer payments and increase financial investment in basic public services in backward regions to narrow the gap with more developed regions, paying particular attention to the living conditions of the people at the bottom.

Create a "work" city cluster corridor, and promote the development of basic public services in the Chengdu-Chongqing region. The two cities around Chengdu, Deyang and Mianyang, are large in scale and tightly connected. Three city belts are formed in this way, namely Chengdu-Chongqing, the center of the main axis of Deyang and the secondary center of the city cluster along the river, which are distributed in a "work" pattern. In the city layout of "Golden Triangle of Innovation", we can promote the linkage development of basic public services in these three "corners" by constructing the interconnection corridor of "Gong".

With new-type urbanization as the main axis, we will promote the integration of urban and rural areas in the Chengdu-Chongqing twin-city economic circle and accelerate the construction of a perfect social security system. Citizens in the Chengdu-Chongqing twin-city economic circle enjoy roughly equal medical, unemployment and pension services in both rural and urban areas. In terms of medical insurance, it will accelerate the medical insurance settlement system in Chengdu and Chongqing in different places and mutual recognition of designated medical institutions. To ensure that the policy, operation and supervision of outpatient medical treatment in different places are open, transparent and effective, citizens who seek medical treatment can fully grasp the effective medical insurance information of the Chengdu-Chongqing twin-city economic circle and choose medical institutions according to the information they have. In terms of unemployment insurance, the principle of uniform standards and transparent supervision is implemented to ensure that unemployed people in Chengdu and Chongqing can enjoy roughly equal unemployment relief services.

5.2. Discussion

Due to the relatively large calculation of the intra-regional Thiel index gap, this paper does not measure the Thiel index between regions, which is still inadequate for the measurement of basic public service parity in the twin-city economic circle of Chengdu and Chongqing. When conducting the inter-regional Thiel index calculation, for the convenience of the study is based on the division of the four regions is based on geographic spatial location, if the combination of the division can be based on the population and financial income of the region, the results may be more instructive. In this paper, time series data from 2012-2020 are selected, and the robustness of the index measurement results has not yet been tested, and the results would be more convincing if they could be tested by the coefficient of variation. These issues are to be further explored.

References

- [1] Li, L.Y. (2022). *Equalization of basic public services for common prosperity: logic of action and path selection*. *China Industrial Economy*, (02):27-41.
- [2] Jia, J. K. (2006). *A theoretical interpretation of the development of public expenditure practices*, *Finance trade economics*, (01):93.
- [3] Sanderson, S. I. (1996). *Evaluation, Learning and the Effectiveness of Public Services: Towards a Quality of Public Services Model*. *International journal of public sector management*, (5-6):90-108.
- [4] Paul S., Islam M.R. (2015). *Ultra-poor char people's rights to development and accessibility to public services: a case of Bangladesh*. *Habitat International*, (48):113-121.
- [5] Saidi A., Hamdaoui M., Moussa W. (2020). *Assessing Policy Effectiveness in Reducing Inequality of Opportunity in Access to Public Services and Education Among Tunisian Children*. *Journal of the Knowledge Economy*, (1)34-36.
- [6] Lin, Y. Y. (2014). *Equalization of basic public services: indicator system, comprehensive evaluation and current situation analysis: an empirical study based on 198 prefecture-level cities in China*. *Fujian Forum (Humanities and Social Sciences Edition)*, (06):184-192.
- [7] Shao Y. F. (2016). *A study on the measurement of equalization of basic public services by local governments and spatial differences--based on data from 21 municipalities in Guangdong Province*. *Journal of Shijiazhuang Railway University (Social Science Edition)*, (03):19-25+45.
- [8] Qi, X. (2015). *The construction of provincial basic public service equalization index system and its application--an empirical study based on Sichuan Province*. *Economic System Reform*, (02):58-63.
- [9] Tang T.W. (2013). *Analysis of basic public service equalization measures of provincial governments in China*. *Economic Management*, 35(11):170-177