On the Influencing Factors of the Equalization of Basic Public Services Based on the Empirical Study of Provincial Administrative Units in China in 2014

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Abstract—**Based on the data of our country's provincial administrative units in 2014, this paper adopts qualitative comparative analysis to explore the asymmetric causality between the equalization of basic public services and each dependent variable. It is concluded that if the level of public employment services is low, then improving the supply of social security services, public health services and environmental protection services is conducive to the equalization of public services. If the level of compulsory education service is low, the supply of social security service, public employment service and environmental protection service should be improved. The low level of social security services significantly hinders the equalization of basic public services.**

Keywords—basic public services equalization; human development index; qualitative comparative analysis

I. INTRODUCTION

At present, the principal contradiction facing Chinese society has evolved. What we now face is the contradiction between unbalanced and inadequate development and the people's ever-growing needs for a better life. Achieving the equalization of basic public services is the top priority of satisfying people's growing needs. Based on the input and output of basic public services in each province in 2014, this paper adopts fuzzy-set qualitative comparative analysis in the relationship study of the equalization of basic public services in each province and its five elements, that is, social security services, compulsory education, public health services, public employment services and Environmental protection service, in a bid to figure out which element can be given the priority to improve the overall level of basic public service equalization.

II. LITERATURE REVIEW

A. The relationship between public services and basic public services

Seen from the components, public service covers basic public service in a broad sense [1]. From the perspective of applicable objects, the key of public services lies in fairness, that is, the public services should not be different due to differences in identity, status and income, but be applicable to all citizens. [2] Whereas, the basic public services give more emphasis on "equalization" and equal opportunity while guaranteeing everyone's rights. From the perspective of connotation, the two come down in one continuous line, and

the two can be integrated. Therefore, the research on public services has important implications for the understanding of the equalization of basic public services.

B. Researches on the public services

In early days, the public services are generally considered in the assessment of the state and the government.[3] It was not until the late 19th century when the capitalist countries like Germany, France, and Britain entered modern industrial society, that the "public service" was proposed as a category of academic research.[4] In the 1980s, with the rise of new public management paradigm, some scholars suggested handing over goods and services of the public sector to the private sector in order to improve the quality and efficiency, which was disapproved by Owen Hughes who believed that there were inherent differences in the responsibility of the public sector and private sector.[5] It is worth noting that although government is supported to continue to provide public services, it does not mean that the government should reserve discretion. As the Denhardts said, in the new paradigm of public service, the government is providing services rather than steering, and public interest is a goal rather than the by-product. The service object is citizens rather than customers, and importance should be attached to the people rather than productivity.[6]

C. Researches on basic public services in China

From the perspective of supply, the academia generally believes that it is necessary to replace the traditional supply mode with new systems and mechanisms, and promote the transformation of government functions. For evaluation criteria, some scholars use financial equalization and other relevant indicators to reflect the degree of basic public service equalization, while others also use Gini coefficient and human development index to evaluate. The academy community has not reached an agreement on the composition of basic public services.

D. Brief summary

This article finally chooses the human development index (HDI) as evaluation standard. As for the elements, it takes into consideration that the basic public services aim to satisfy citizens' basic and urgent needs, and adopts the service levels of social security, compulsory education, public health, public employment and environment protection as variables.

III. DESIGN AND MEASUREMENT OF THE EVALUATION SYSTEM FOR THE EQUALIZATION OF BASIC PUBLIC SERVICES AMONG PROVINCES IN CHINA

A. Research methods

Qualitative comparative analysis (QCA) is a data analysis technique based on Boolean algebra for determining which logical conclusions a data set supports. It regards the cases that are related to the study as the combination of a series of conditions. These results to be interpreted are defined as the result variable. The reason of the result is defined as the condition variable. Researchers find the logical relationship between the two according to the comparative analysis of cases, and figure out the condition combination that influences the result after simplification. [7]

The advantage of qualitative comparative analysis lies in that it is not demanding in sample size, focuses on the asymmetry of conditions and results, and produces streamlined results.

B. Outcome variables and measurement

Human development index, proposed by the United Nations Development Program, has been widely applied to analyze the equalization level of our country's basic public services and the related study. [8]

TABLE I.   HDI INDEX

HDI					
Beijing	0.869	Anhui	0.72	Sichuan	0.72
Tianjin	0.843	Fujian	0.758	Guizhou	0.673
Hebei	0.735	Jiangxi	0.726	Yunnan	0.668
Shanxi	0.738	Shandong	0.769	Xizang	0.6
Neimenggu	0.766	Henan	0.727	Shaanxi	0.751
Liaoning	0.798	Hubei	0.754	Gansu	0.689
Jilin	0.768	Hunan	0.735	Qinghai	0.694

Cont. to TABLE I					
Heilongjiang	0.755	Guangdong	0.772	Ningxia	0.727
Shanghai	0.852	Guangxi	0.713	Xinjiang	0.718
Jiangsu	0.798	Hainan	0.738		
Zhejiang	0.798	Chongqing	0.747		

Note: data is collected from China Human Development Report 2016 released by the United Nations

C. Conditional variable

Social security level, compulsory education level, public health level, public employment level and environmental protection level are selected as the condition variables in this paper. Considering that the same financial input may not achieve the same level of public service, the equalization of financial capacity cannot be directly equivalent to the equalization of basic public service. Therefore, this paper establishes an evaluation system including input, output and result to reflect the supply of various condition variables in each province. Input indicators include financial investment and the human input. Output indicators reflect what the government has done to provide public goods, to show the provincial government's supply efficiency of basic public services. The result index refers to key performance results after the basic public service supply, which reflects the goal of some basic public service.[9]

D. Calibration of variables

The anchors setting of the outcome variable and five condition variables refer to the Fiss's study in 2011. The three anchors of human development index, the service level of social security, compulsory education service level, the level of public health services, public employment service level and service level environmental protection are set with the upper quartile, average score and lower quartile acquired after return. The calibration anchor points of each variable are shown in TABLE II:

TABLE II.   THE CALIBRATION ANCHOR POINTS OF EACH VARIABLE

Variables		Variable symbols	Anchor		
			Completely not belong	Largest fuzzy point	Completely belong
Result variable	Human development index	HDI	0.7000	0.7380	0.7685
Condition variables	Social security level	S	95.05884	97.77032	103.1399
	Compulsory education level	E	94.27598	102.5739	112.4242
	Public health level	T	67.45483	82.93396	103.8085
	Public employment level	J	97.2101	105.1849	111.9567
	Environmental protection level	EP	74.75619	87.2594	119.2355

The variable anchor points are input into fs/QCA to calculate the assignment table of fuzzy sets of each variable, as shown in TABLE III:

TABLE III.   FUZZY SET ASSIGNMENT RESULTS OF EACH VARIABLE

	HDI	Low HDI	S	E	T	J	EP
Beijing	1	0	1	0.92	1	0.01	1
Tianjin	1	0	1	0.99	0.04	0	0.01
Zhejiang	1	0	1	0.5	0.99	0	0.28
Liaoning	1	0	0.99	0.03	0	1	0.52
Guangdong	0.97	0.03	0.99	0.26	0.88	0.47	0.97
Jilin	0.95	0.05	0.96	0	0.56	0.99	0.75
Jiangsu	1	0	0.95	0	0.98	0.91	0.83
Heilongjiang	0.84	0.16	0.86	0.06	1	0.98	0.63
Shandong	0.95	0.05	0.82	0.02	0.99	0	0.98
Chongqing	0.71	0.29	0.8	0.99	0.01	0.09	0.99
Xinjiang	0.03	0.97	0.79	0.24	0	0.74	0.06

Cont. to TABLE III							
Shaanxi	0.78	0.22	0.63	0.97	0.34	0.96	0.44
Hainan	0.5	0.5	0.5	0.04	0.42	0.5	1
Anhui	0.05	0.95	0.27	0.44	0.08	0.6	0.39
Jiangxi	0.12	0.88	0.21	1	0.89	0.34	0.72
Hubei	0.83	0.17	0.16	0.16	0.99	0.83	0.01
Qinghai	0	1	0.16	1	0	0.99	0.97
Ningxia	0.14	0.86	0.11	0.99	0	0.99	1
Shanxi	0.5	0.5	0.09	0	0.88	0.99	0.04
Hunan	0.38	0.62	0.08	0.64	0.57	0.4	0
Fujian	0.88	0.12	0.03	0.33	0.93	0.91	0.19
Sichuan	0.05	0.95	0.02	0.74	0.05	0.01	0.23
Gansu	0	1	0.01	0	0	0.71	0.81
Yunan	0	1	0	0.4	0.9	0	0.02
Hebei	0.38	0.62	0	0.88	0.2	0.94	0.8
Guizhou	0	1	0	1	0.08	0.02	0.28
Henan	0.14	0.86	0	0.82	1	0.18	0
Guangxi	0.02	0.98	0	1	0.23	0	0.01

Note: Shanghai, Tibet Autonomous Region and Inner Mongolia Autonomous Region are excluded in the operation due to the failure in the fs/QCA software caused by the deficient data.

E. Analysis of necessary conditions

After the establishment of the assignment table, the condition variables should be checked for necessity to verify whether they are necessary for the result. In general, if the consistency of a conditional variable is greater than 0.9, then it can be regarded as the necessary condition of the result and excluded in the subsequent Boolean simplification.

The necessary condition analysis processed by fs/QCA software is shown in the table:

TABLE IV.   NECESSARY CONDITION ANALYSIS OF SINGLE CONDITIONAL VARIABLE (OUTCOME=HDI)

Variables	Implication	Consistency
S	High service level	0.777074
E	High service level	0.418425
T	High service level	0.715893
J	High service level	0.633615
EP	High service level	0.605485
~S	Low service level	0.353024
~E	Low service level	0.656821
~T	Low service level	0.407173
~J	Low service level	0.490155
~EP	Low service level	0.473277

TABLE V.   NECESSARY CONDITION ANALYSIS OF SINGLE CONDITIONAL VARIABLE (OUTCOME= LOW HDI)

Variables	Implication	Consistency
S	High service level	0.234398
E	High service level	0.680697
T	High service level	0.404935
J	High service level	0.530479
EP	High service level	0.467344
~S	Low service level	0.899855
~E	Low service level	0.396952
~T	Low service level	0.722061
~J	Low service level	0.597242
~EP	Low service level	0.613933

TABLE IV shows that under the premise of a high HDI, no consistency of variable is higher than 0.9. Therefore, it is deemed that no variable is a necessary condition of a high HDI. As shown in TABLE V, the consistency of ~S (that is, the low level of social security services) is 0.899855, very close to 0.9. Therefore, it can be regarded as the necessary condition that leads to the low level of equalization of basic public services.

The results show that the low level of social security service has obvious restraining effect on the equalization of basic public services, which should be excluded in the later conditional combination analysis.

F. Build the truth table

The purpose of constructing the truth table is to determine the critical value of the consistency score to distinguish which combinations pass the consistency of fuzzy set theory and which fail. The failed combinations will be excluded as "logical remainder". Combinations with consistency score equal to or above the critical value are designated as the fuzzy subset of the results and are encoded as 1. Combinations below the critical value do not constitute the fuzzy subset and are encoded as 0 (Ragin 2000).

Enter the data in TABLE III into fs/QCA, and set the outcome as HDI. The truth table obtained after deleting the remaining logical items is shown in TABLE VI.

TABLE VI.   TRUTH TABLE (OUTCOME=HDI)

S	E	T	J	EP	number	HDI	Raw consist.	PRI consist.	SYM consist
1	0	1	1	1	3	1	0.990415	0.9869	0.9869
1	0	1	0	1	2	1	0.987755	0.982955	0.982955
1	1	1	0	1	1	1	0.938144	0.923077	0.923077
1	0	0	1	1	1	1	0.875	0.796875	0.796875
0	0	1	1	0	3	1	0.868035	0.736842	0.947368

Input the data in TABLE III into fs/QCA, and set the outcome as Low HDI. The truth table obtained after deleting the remaining logical items was shown in TABLE VII.

TABLE VII.   TRUTH TABLE (OUTCOME=LOW HDI)

S	E	T	J	EP	number	Low HDI	Raw consist.	PRI consist.	SYM consist
0	1	0	0	0	3	1	1	1	1
0	1	1	0	0	2	1	1	1	1
0	1	1	0	1	1	1	1	1	1
0	0	0	1	1	1	1	0.985294	0.972973	0.972973
0	0	0	1	0	1	1	0.983051	0.967033	0.967033
0	0	1	0	0	1	1	0.971429	0.930556	0.930556
0	1	0	1	1	3	1	0.90027	0.855469	0.931915

G. *Conditional combination analysis*

When the outcome equals HDI, the condition combination analysis is shown in the TABLE VIII:

TABLE VIII.   CONDITIONAL COMBINATION ANALYSIS BASED ON EQUILIBRIUM STRATEGY (OUTCOME=HDI) FREQUENCY CUTOFF= 1 CONSISTENCY CUTOFF: =0.868035

	Row coverage	Unique coverage	Consistency
S*T*~J*EP	0.243319	0.161041	0.96648
S*~E*J*EP	0.276371	0.181435	0.937947
~S*~E*T*J*~EP	0.208158	0.178622	0.868035
solution coverage: 0.616034			
solution consistency: 0.919203			

When the outcome equals Low HDI, the condition combination analysis is shown in the TABLE IX:

TABLE IX.   CONDITIONAL COMBINATION ANALYSIS BASED ON EQUILIBRIUM STRATEGY (OUTCOME=LOW HDI) FREQUENCY CUTOFF= 1 CONSISTENCY CUTOFF:= 0.90027

	Row coverage	Unique coverage	Consistency
~S*E*~J*~EP	0.392598	0.15312	0.998155
~S*T*~J*~EP	0.250363	0.0478955	0.985714
~S*~E*~T*J	0.201016	0.0174165	0.989286
~S*E*T*~J	0.230769	0.0275763	1
~S*~T*J*EP	0.333817	0.177068	0.921844
solution coverage: 0.761974			
solution consistency: 0.960659			

Note: * stands for "and"; ~ stands for "no"

When the outcome is human development index, since there is no single conditional variable as a necessary condition for the outcome, the explanatory power of the conditional combination on the outcome variable is emphatically analyzed. The condition combination "S*T*~J*EP" can be interpreted that under the high social security service level, high public health service level, high environmental protection service level and low public employment service level, the equalization level of basic public services is high, that is, the consistency is higher than 0.9. The condition combination "S*~E*J*EP" can be translated into that under the high social security service level, high public employment service level, high environmental protection service level and low compulsory education service level, the equalization level of basic public service is high, that is, the consistency is higher than 0.9. Moreover, Condition combination "~S*~E*T*J*~EP" can be explained that under the high level of public health service, high level of public employment service, low level of social security services, low level of compulsory education service, environmental protection, the service level of the equalization of basic public service level is relatively high. However, due to the consistency is below 0.9, and the Row coverage is lower than the first two conditions, so the combination is not regarded the necessary condition of the result.

When the outcome represents Low HDI, the five condition combinations contained in Table IX won't be analyzed as they consist of the ~S (low social security service level) which has been proved as the requirement of the result.

IV.   CONCLUSION AND ENLIGHTENMENT

According to the results of qualitative comparative analysis, some provinces with low level of public employment should give consideration to social security service, public health service and environmental protection service. For provinces with low level of compulsory education, they should improve the level of social security, public employment and environmental protection while improving the education system, which is beneficial to the equalization of basic public services in China.

In addition, this paper finds that the low level of social security services significantly restricts the realization of the equalization of basic public services, so the provincial administrative units should put the improvement of social security services high on the agenda.

As for the deficiency of this paper, first of all, the data needs to be further improved. Secondly, the score of each provincial administrative unit in the fuzzy set valuation table only comes from the result of regression, which cannot fully reflect the real situation of each region. Finally, this paper is only based on the research on the status of each provincial administrative unit in 2014. Whether the conclusions obtained are applicable to the condition in other years, or to cities, districts and counties and rural areas, still needs further study and exploration.

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