

Research on constructing composite indicator of objective well-being from China mainland

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1. Introduction

People's Republic of China, which has a total population of about 13 billion, economically frail before 1978, has again become one of the world's major economic powers with the great potential. In the past 30 years, China's economy has developed at an unprecedented rate, and that momentum has been held steady into the 21st century. But as the biggest developing country, China's rapid development faces a series of new problems including environmental pollution, income inequality, food safety, etc, the effort to safeguard and improve people's quality of life (QOL) has become a focus in recent years. Now the public policy aims at improving people's well-being and raise the level of public services has been included in the Twelfth Five-Year Plan (2011-2015)(China adopts the "five-year-plan" strategy for economic). This is an appropriate time to develop a composite index to evaluate and monitor the well-being in China mainland.

The study of QOL indices had been initiated since 80s last century in China. Currently, some progress had been made in this research field and can be summarized into three stages.

The initial research in China mainland could be traced back to the draft of social statistical indicators prepared by National Bureau of Statistics of China in 1983. In the mid-80s, Chinese-American sociologist Lin cooperated with Tianjin Academy of Social Sciences and Shanghai Academy of Social Sciences to study the urban residents' quality of life (Lin, et al. 1989). This research defined quality of life based on the satisfaction orientation, obviously from the subjective well-being tradition. For example, through factor analysis and structural model analysis, Lin and his colleague set forth a series of structures and indicators for urban residents' quality of life. Specifically, this study selected 22 aspects of peoples' lives, and classified into five categories through factor analysis: the social characteristics of work, the economic characteristics of work, the family relationships, the relationships outside the family and leisure time. In contrast with scholars' definitions of quality of life, the government departments and policy research institutions put emphasis on objective well-being that can reflect social development, the data availability and effectiveness of policies.

Since 1990s, Chinese Academy of Social Science, National Bureau of Statistics, Ministry of Agriculture and other organizations attempted to define the concept of well-off and use a statistical monitoring indicator system to describe the process of building a well-off society in China (National Bureau of Statistics of China, 1992-2010). As an indispensable part of this indicator system, quality of life, especially the objective content, has been concerned by policy-makers and society. Meanwhile, in order to narrow the gap with foreign researchers, Chinese researchers keep in cooperation and exchange with Western scholars actively (Zhou. et al, 2004). For this reason, much more advanced technologies and approaches have been introduced and applied to Chinese QOL researches, particularly in the development of objective well-being indicators.

Recently, with the strategic decision to build a harmonious society in China, subjective well-being (as the core indicators of QOL) has been brought into public focus.

Meanwhile, a group of young scholars are becoming the main force in this field (Zhou. et al, 2004; Xing et al, 2007). In addition, in order to make the research results serve the public policy making, Chinese scholars paid more attention on the relationship between public policy and people's quality of life. This reflected in the concept's defining, the indicator's selecting and the related research report's presenting.

The aim of this research is to develop a composite indicator of objective well-being from China mainland, which could provide both theoretical and practical implications for public policy.

2. Concept of Well-being

Reviewed from the literature on QOL, there is an absolute consensus that a comprehensive definition of QOL must include two linked dimensions, namely objective and subjective dimensions, and an increasingly number of comprehensive concepts of well-being which reflect both individual well-being and social well-being have been put forward. Examples can easily be found to show this trend.

Erik Allardt (Allardt, 1973) started from distinguishing between three basic needs of human beings, namely Having, Loving, and Being, to propose his concept of well-being, which includes objective conditions and subjective need satisfactions. Obviously, there is a great deal of difference between such a broader concept of quality of life and the traditional Scandinavian level of living approach (Erikson, 1993; Uusitalo, 1994). In addition, based on the constellation of objective living conditions and subjective well-being across different life domains, German notion of QOL also combines with objective and subjective dimensions together (Zapf, 1984). In this concept, well-being means good living conditions and positive subjective well-being. Another comprehensive concept of well-being was explored by the UK policy makers and stakeholders who identify the well-being as an implicit goal of Government policy. Such a common understanding of well-being was developed on the UK 2005 sustainable development strategy, *Securing the future*, released by Defra (Department for Environment, Food and Rural Affairs) and other government department of UK (Defra,2005):

“Well-being is a positive physical, social and mental state; it is not just the absence of pain, discomfort and incapacity. It requires that basic needs are met, that individuals have a sense of purpose, that they feel able to achieve important personal goals and participate in society.”

Moreover, this statement considers that well-being is enhanced by some essential

al conditions, “Supportive personal relationships, strong and inclusive communities, good health, financial and personal security, rewarding employment, and a healthy and attractive environment.” Among others things, such understanding of well-being links with public policy by emphasizing the role of government about peoples’ well-being, which is to enable people have a fair access to achieve the social, economic and environment resources now and in the future.

Therefore, taking into account this trend on concept of well-being that has been discussed above, this research defines quality of life as the quality of people's being (existence), which is used in analyzing the wellbeing of people' living condition and reflecting their subjective experience on the living condition (**Fig. 1**). In fact, this definition can be explained from four aspects as follows:

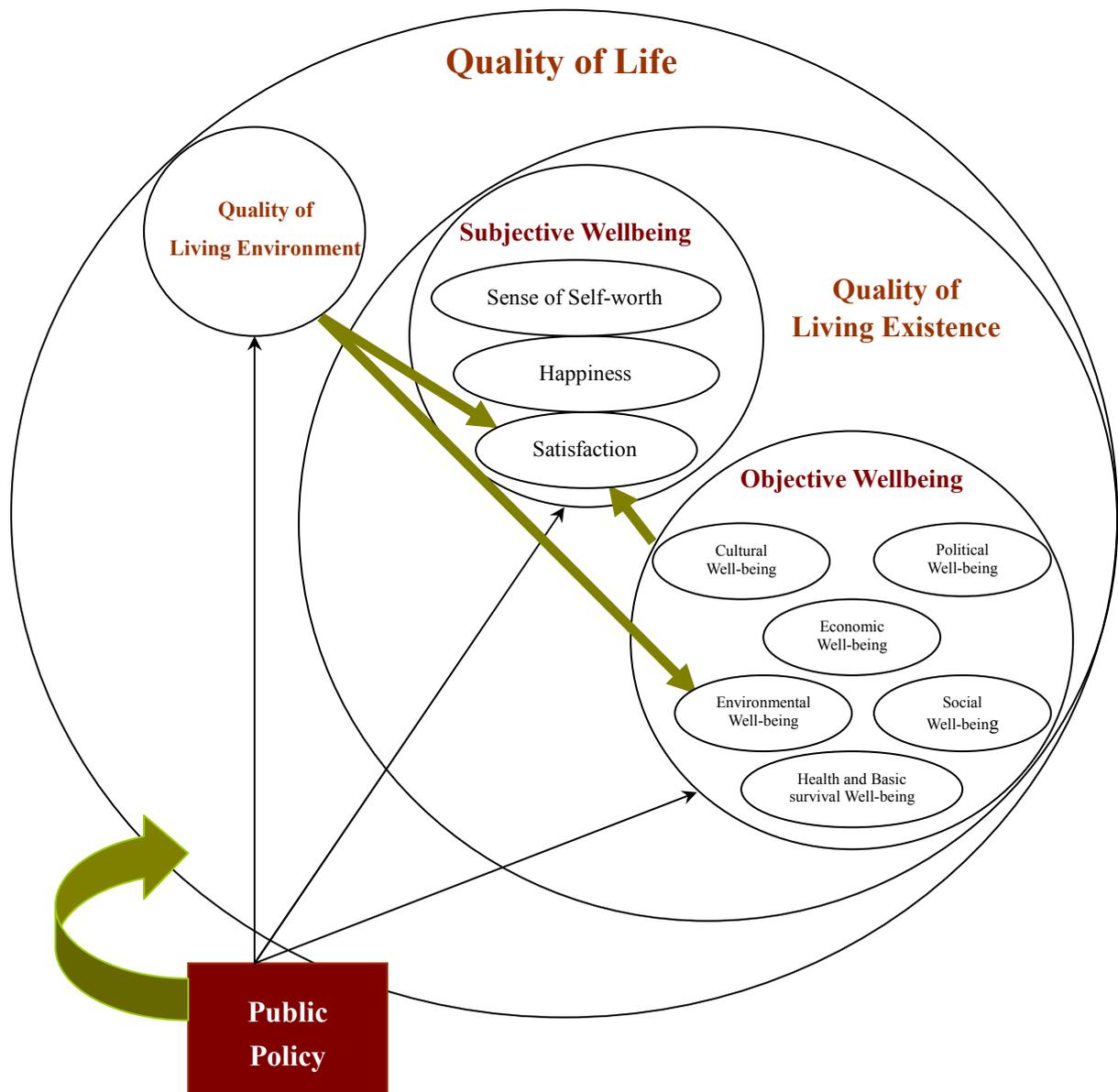


Fig.1 the structural model of Chinese well-being based on public policy

1. Combining the quality of people’s existence as well as the quality of the natural environment (Environmental well-being), Quality of life could be regarded as a c

omplex system which adheres to the point view of sustainable development.

2. The quality of people's being (existence) means the degree of people's need are being met, it is determined by the condition of people's surviving and developing (objective wellbeing) and reflected in the level of subjective experience (subjective well-being).

3. Subjective well-being here is defined as people's own subjective experience on his or her surviving and developing conditions, furthermore, it is the constellation of satisfaction, happiness and sense of self-worth. Specifically, satisfaction refers to the residents' cognition and evaluation of different domains; Happiness is the positive emotion that people experience; Sense of self-worth means a person's target location and spiritual support of life.

4. Objective wellbeing refers to the conditions that people obtain from the natural and social system, including Health and Basic survival well-being, Economic well-being, Political well-being, Social well-being and Cultural well-being. Furthermore, as a component of objective conditions, quality of natural living environment also could be included, and could be named as Environmental well-being.

3. Methods and Results

Considering that the characteristics of objective indicators (based on social quality) and subjective indicators (based on individual quality, including satisfaction of some life domains, happiness and sense of self-worth) may be different, we used different approaches to construct the Chinese subjective and objective well-being indicator system, as well as to obtain the weights of their components. We have reported our exploring on Chinese subjective wellbeing (Xing, 2009), and this research would focus on the constructing of Chinese objective well-being indicators system and its component weights determining.

3.1 Design of Life domains and sub-classifications

According to our definition of quality of life, this research defines six major domains of objective well-being, namely Health and Basic survival well-being, Economic well-being, Environment well-being, Cultural well-being, Social well-being, and Political well-being. Definitions of these six life domains are presented as follows:

Health and Basic survival well-being, a fundamental dimension of quality of life indicator system, is defined as the conditions provided by society to meet citizens' need of health and basic survival as well as citizens' satisfaction of these conditions. To meet the needs of health and basic necessities of life is the most necessary conditions to ensure that people can engage in normal economic, political, social, and cultural activities. According to this definition, it could be evaluated from dimensions of health and basic survival.

Economic well-being is defined as the situation of residents' material wealth and its fairness, which are reflected by the sub-classifications of income level, consumption level, as well as labor and employment. While emphasizing residents' real income level, we pay more attention to fairness and rationality of the results of economic development in this dimension. Specially, income level focuses on measurement of residents' income level and its fairness, while consumption level focuses on measurement of residents' consumption level. In addition, Labor and employment is regarded as the measurement of residents' employment status and the rationality of overall economic structure.

Environment well-being is regarded as some appropriate conditions provided by natural environment to meet people's survival, reproduction and development during a period of time. As a result of the protection and the governance of the natural environment by people in order to maintain these conditions favorable, people can maintain positive interaction between human activities and the environment. According to the definition of environment well-being which is mainly based on the theory of sustainable development, we set up two sub-classifications: resources and environmental quality, environmental pollution and governance. The two parts represent the evaluation of the quality of existing environment and resources, as well as the situation of environmental pollution and governance.

Cultural well-being could be defined as the security condition of a variety of spiritual activities and products, which is a reflection of the quality of spiritual life of the residents and one of the crucial criteria of the comprehensive and sustainable development of human beings. According to this definition and a synthesis of current situation of the research at home and abroad, we construct a primary index framework of culture well-being in terms of the education level and leisure resources (including multifarious arts, sports and recreational activities). The education level refers to the potency dimension of the input and achievements of the output while the leisure resources refer to the degree of the leisure products and services the inhabitants obtained.

Social well-being is the government universally provided all citizens a social system in accordance with law to guarantee a certain standard of living and improve the fund and services for quality of life as much as possible. It aims to solve all aspects of social welfare issues for the majority of social members, including protection and non-protection of the welfare in the whole. In the sub-classification level: (1) Relief protection is a way of guarantee that the central and local government provided the basic living security relief to poverty group or residents facing temporary difficulties. It covered protection situation of minimum living groups, social vulnerable groups and temporary disadvantaged groups. (2) Social interaction is the people's voluntary activities to help the disadvantaged. Their funding mainly come from donations and the voluntary payment, and the government often provides taxation support. (3) Welfare service is the state and region input state in terms of infrastructure and public services to protect and improve quality of life of the residents. (4) Public safety refers to the life and health of most people, as well as safety of public property, which is the basic element to protect the residents enjoying a normal life. In this research, this facet is not analyzed due to the absence of valid data.

Political well-being refers to freedom and human rights citizens enjoying from a democracy system arrangement. Political demand is developed on the basis of a higher level of economic demand, this demand mainly for the desire for political freedom, the acquisition and use of political power and the participation in political process, etc. Political well-being is determined by the extent that people's political rights are realized, it has an important effect on individuals' whole quality of life. In this research, political well-being is not analyzed due to the absence of valid data.

3.2 The Selection of Chinese objective wellbeing indicators

Based on a great number of western studies on well-being indicators construction, and previous Chinese scholars' researches of QOL, this research chose about 120 related indicators mainly from *China Statistical Yearbook* for the selection by Content

Validity Ratio analysis and Correlation analysis. The indicators whose data merely collected at the national level were excluded in the next analysis step.

However, because of the different unit among these indicators, the non-dimensional indicators of treatment must be done before data analysis. This treatment was computed from the following formulas:

$$Z_i = \frac{X_i - X_{\min}^i}{X_{\max}^i - X_{\min}^i} \quad (\text{For the positive indicators, such as Life expectancy})$$

$$Z_i = \frac{X_{\max}^i - X_i}{X_{\max}^i - X_{\min}^i} \quad (\text{For the negative indicators, such as Perinatal mortality})$$

Where X_i is an index data of a specific province in China mainland for a year, X_{\min}^i is the minimum data of the same index in the same year among 30 province, X_{\max}^i is the maximum data of the same index in the same year among 30 province, Z_i is the new data as a result of the non-dimensional treatment, and will be analyzed in next steps.

3.2.1 Content Validity Ratio analysis

Through the research literature searching, we chose a number of scholars in the QOL or other related research fields and got contact with them by mail, E-mail or telephone to help us on selecting the appropriate indicators from these alternatives. **Fig.2** and **Fig.3** show the regional and gender distribution of the experts who participated in our survey for content validity ratio analysis. Moreover, most of these experts also took part in another survey of our study for the AHP analysis.

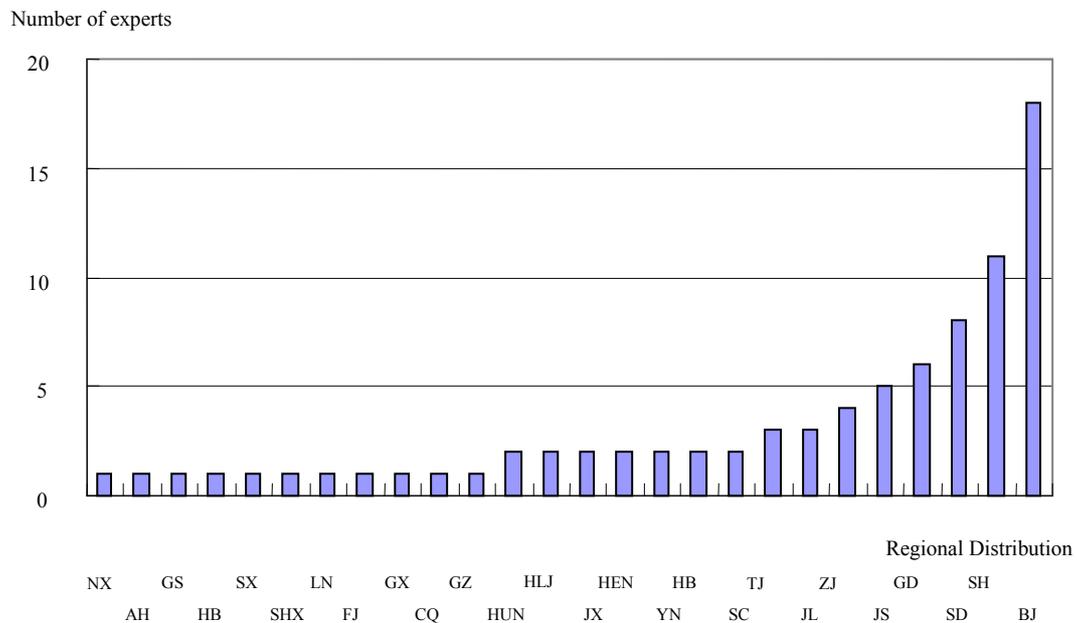


Fig. 2 The regional distribution of experts who participated in the survey

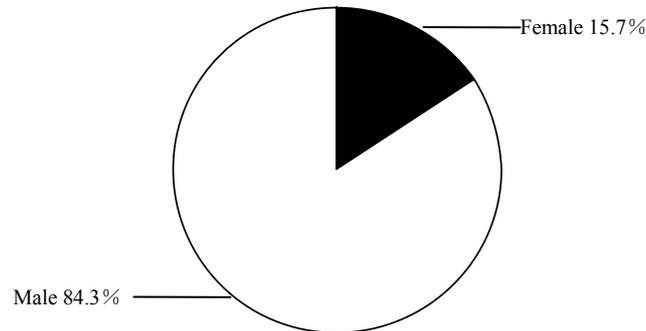


Fig. 3 The gender distribution of experts who participated in the survey

The content validity ratio (CVR) refers to the extent to which a measure represents all facets of a given social construct. By completing the likert scale we designed, every expert was asked to evaluate the relevance of each indicator that we chose to evaluate quality of life. Then the content validity of ratio of each indicator was computed from the following formula (Lawshe, 1975):

$$CVR = \frac{n_i - \frac{N}{2}}{\frac{N}{2}}$$

Where n_i is the number of experts indicating “essential” for one indicator and N is the total number of experts. According to the psychometrics, if the CVR of one item is greater than or equal to 0.6, this item should be appropriately accepted. Considering the complexity of social statistics, we chose 0.5 as a criterion for selecting social indicators for this composite indicator of well-being. In this way, those indicators with the CVR greater than or equal to 0.5 will be analyzed further.

3.2.2 Correlation analysis

The correlation between social indicators is another index that should be taken into account during the process of indicators selecting. It is unacceptable neither high nor low correlation. First of all, we collected data of each social indicator from 2000 to 2009 to form a database and did the non-dimensional treatment. Second, the correlation analysis was operated between every two indicators which were in the same sub-classification, and between the sum of all indicators from the same sub-classification and one of those indicators. Second, we set the criterion in this step for indicators selection: If an indicator presents a highly positive correlation with the sum of all indicators in the same sub-classification as well as presents a low positive correlation with other indicators in the same sub-classification, it should be selected into the next analysis procedure.

Then, by CVR analysis and correlation analysis, a total of 46 indicators were selected to constitute the Chinese objective well-being index (**Table 1**).

Table 1 Description of composite indicator of objective wellbeing from China mainland

Wellbeing index	Sub-classification	Indicators
Health and Basic Survival wellbeing	Health	Number of doctors per thousand population
		Mortality rate of children under-five
		Perinatal mortality
	Basic survival	Life expectancy
		Coverage rate of rural population with access to running water
		Consumer spending accounts for clothing in the ratio of per capita annual consumption expenditure
		Per capita floor space of residential building
		Coverage rate of urban population with access to gas
		Coverage rate of rural population with access to sanitary latrines
		Number of civilian passenger cars per thousand population
		Coverage rate of road accessibility in rural and towns
		Mortality rate per ten thousand cars
		Economic wellbeing
Gini Coefficient		
Consumption level	Annual Per Capita Living Expenditure of Urban and rural residents Households	
	Consumer Price Index	
Labor and Employment	Urban and rural residents Household's Engel's Coefficient	
	Registered Urban Unemployment Rate	
Environment wellbeing	Resources and Environment quality	The Ratio of Value-added of the Tertiary Industry to GDP
		The Ratio of Total Wages Bill of Staff and Workers to GDP
		Energy Consumption per Unit of GDP
	Environment pollution and governance	Urban air quality compliance rate
		Per Capita Green Covered Area in the urban
		Amount of COD Discharged
		Total Volume of Industrial Waste Gas Emission
		Industrial Wastewater Discharge compliance rate
		Proportion of Comprehensive utilization of industrial solid waste
		Investment in Anti-pollution Projects as Percentage of GDP
Proportion of Harmless Treated Garbage in the urban		
Cultural wellbeing	Education level	Teacher- student ratio of elementary, middle and high education
		Adult Literacy Rate
		Average years of education of six years old and above
	Leisure resources	Ratio of Cultural and recreational consumption in aggregate consumption expenditure
		Per capita expenditure for operating of cultural undertakings
		Users accessing the Internet per million
Social wellbeing	Security and relief	Popularity rate of the color television receiver
		Numbers of published books, newspapers and magazines
		Basic social insurance coverage ratio
		Capita unemployment insurance benefits paid
		Urban low level of average expenditure
	Social solidarity	Rural minimum insurance average level of expenditure
		Per expenditure on civil affair expenses
		Ten-thousand capita the number of social organizations
	Welfare services	Number of social donations capita
		Thousand capita the number of hospital beds
		Ten-thousand capita the number of urban benefit the public networks
		Ten-thousand capita the number of urban public toilets

3.3 A Subjective and Objective Integrated Approach to Determine Attribute Weights

In this research, we applied the combined method of analytic hierarchy process (AHP) and principal component analysis (PCA) to the comprehensive evaluation of objective well-being. In the first stage, the weights of each indicators, sub-classification

and major domain were obtained by AHP, and then an objective analysis was made, namely PCA, to evaluate the objective well-being through objective approach.

3.3.1 Analytical Hierarchy Process

The Multi Criteria Decision Making (MCDM) is a set of techniques which is able to weight and score a range of criteria and then the scores are ranked by the expertise and other related interested groups. Analytical Hierarchy Process (AHP) is one of the MCDM methods which are widely applied to human field such as project design, policy evaluation, and resources allocation (Cheng et al, 2005). In addition, the previous researches show that this subjective approach of obtaining weights is very suitable for solving complicate issues (Yuksel et al. 2007), and it was applied in obtaining subjective weights for composite well-being index. (Sedigheh, et al, 2009; Lee, et al, 2011)

In this research, the AHP procedure involves three basic steps (Satty, 1985):

(1) The hierarchy construction: In this stage, the objective wellbeing we have defined was decomposed into its component parts of which every possible attributes are arranged into multiple hierarchical levels (Fig. 4). The criteria and sub-criteria are not each equally important to the decision at each level of the hierarchy and each alternative rates differently on each criteria. Then, we combined and consolidated the evaluations of the alternatives and criteria by group involved in the decision-making task by the analytical process provided by AHP.

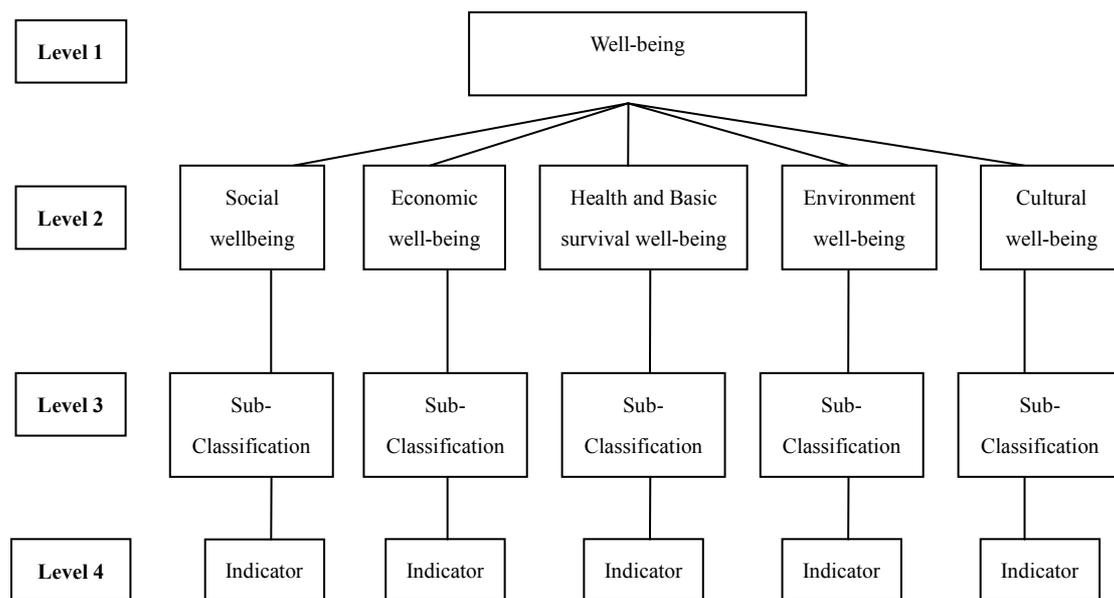


Fig. 4 Structured hierarchy of objective well-being from China mainland

(2) Defining and executing data collection to obtain pair-wise comparison data on elements of the hierarchical structure. Given a pair-wise comparison, the analysis involves two tasks: ①Developing a comparison matrix at each level of the hierarchy starting from the second level and working down. The comparisons were carried out through expert survey. Table 2 shows the 9-point scale used in this study is ranging from 1 (indifference or equal importance) to 9 (extreme preference or absolute importance). This pair-wise comparison enabled the decision maker (experts) to evaluate the con

tribution of each factor to the objective independently, there by simplifying the decision making process. ②Computing the relative weights for each element of the hierarchy

Table 2 9-point intensity of relative importance scale (Satty and Kearns, 1985)

Intensity of Importance	Definition	Explanation
1	Equal importance	Two activities contribute equally to the objective
3	Weak importance	Experience and judgment slightly favor one activity over another of one over another
5	Essential or strong importance	Experience and judgment strongly favor one activity over another
7	Demonstrated importance	An activity is strongly favored and its dominance
9	Absolute importance	The evidence favoring one activity over another is of the highest possible order of affirmation
2,4,6,8	Intermediate values	When compromise is needed
Reciprocals of above nonzero	Between the two adjacent judgments	If activity <i>i</i> has one of the above nonzero numbers assigned to it when compared with activity <i>j</i> , then <i>j</i> has the reciprocal value when compared with <i>i</i>

and estimating the consistency ratio (*CR*) to check the consistency of the judgment. After the survey, each expert's choice in AHP judgment was collected by computer software and the relative weights of the objectives and corresponding criteria and the consistency ratios of the matrices can be calculated. The matrix has reciprocal properties, which are:

$$a_{ij} = 1/a_{ji}, \quad a_{ij} = 1, \quad i, j = 1, 2 \dots n$$

After all pair wise comparison matrices are formed, the vector of weights is computed on the basis of Satty's eigenvector procedure (Satty, 1985):

$$a_{ij} = \prod_{l=1}^m a_{ij,l}^{\lambda_l}, \quad i, j = 1, 2 \dots n$$

$$\lambda \in \Omega$$

The consistency ratios of the matrices can be computed from the following formulas:

$$CI = \frac{\lambda_{max} - n}{n - 1}$$

$$CR = \frac{CI}{RI}$$

Where λ_{max} value is an important validating parameter in AHP and is used as a reference index to screen information by calculating the Consistency Ratio (*CR*) of the estimated vector. To calculate the *CR*, the Consistency Index (*CI*) for each matrix of order *n* can be obtained from the first formula. Where, *RI* is the random consistency

ncy index obtained from a randomly generated pair-wise comparison matrix. Suggested by Satty (Satty, 1980), if $CR < 0.1$, then the comparisons are acceptable. If, however, $CR \geq 0.1$, the values of the ratio are indicative of inconsistent judgments and this expert's choice on this matrix will be excluded.

(3) Constructing an overall priority rating. The final weight was computed by computer software at group level (**Fig.5-8**).

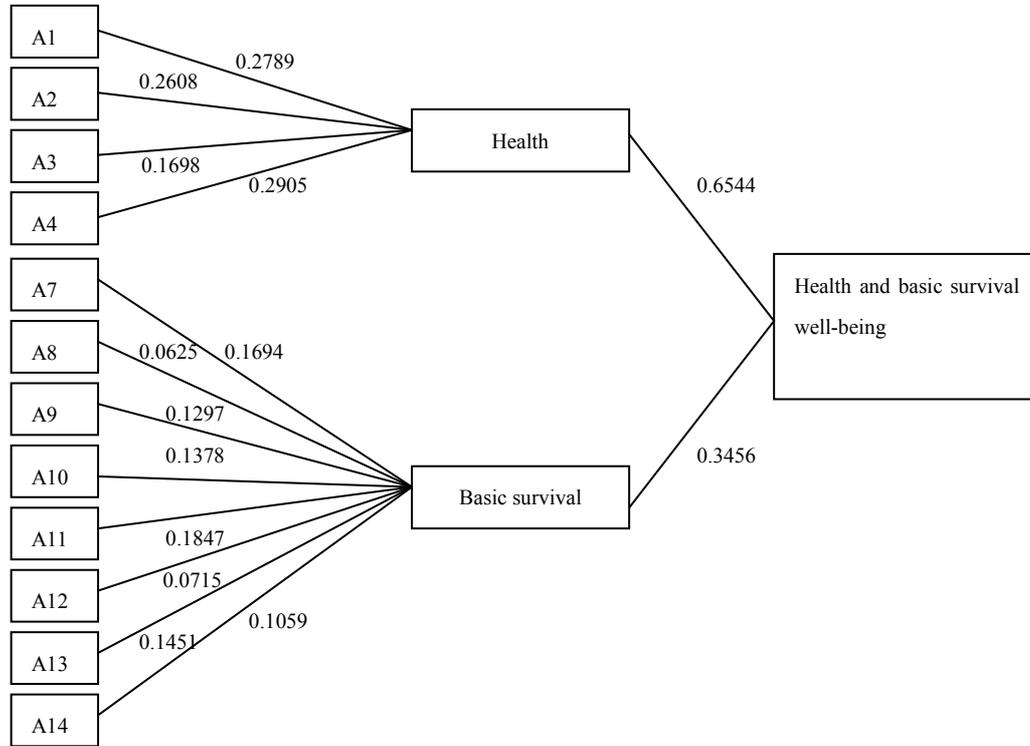


Fig. 5 Causal model of health and basic survival well-being

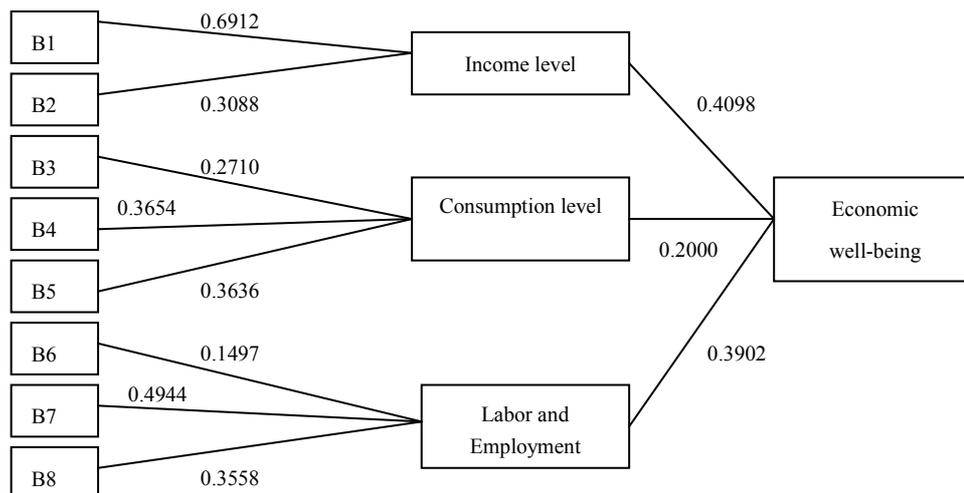


Fig. 6 Causal model of economic well-being

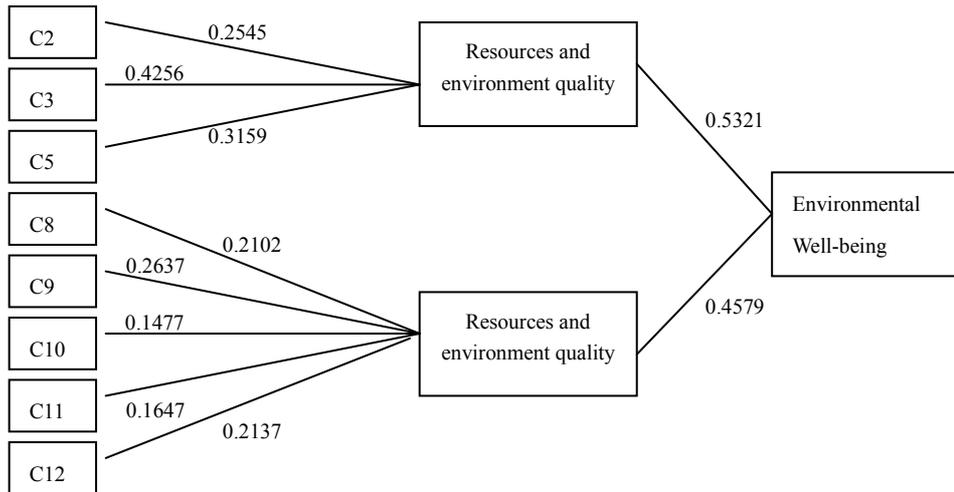


Fig. 7 Causal model of environmental well-being

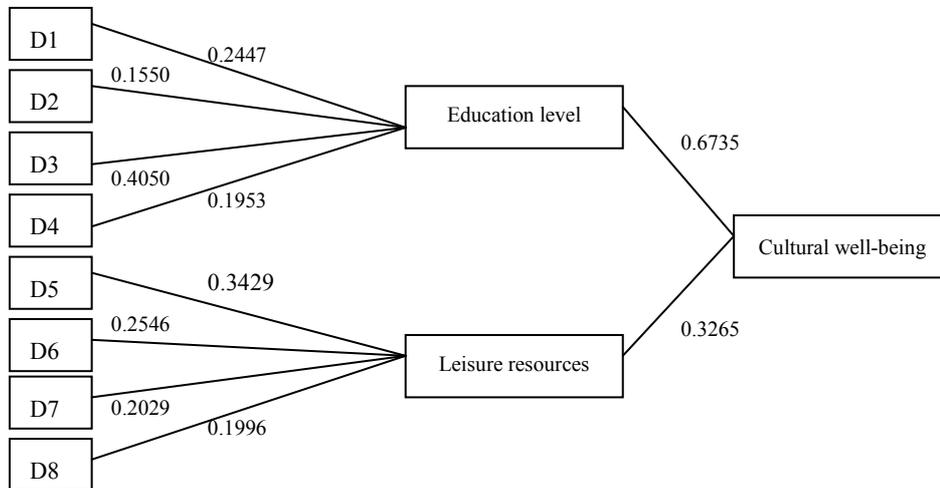


Fig. 8 Causal model of cultural well-being

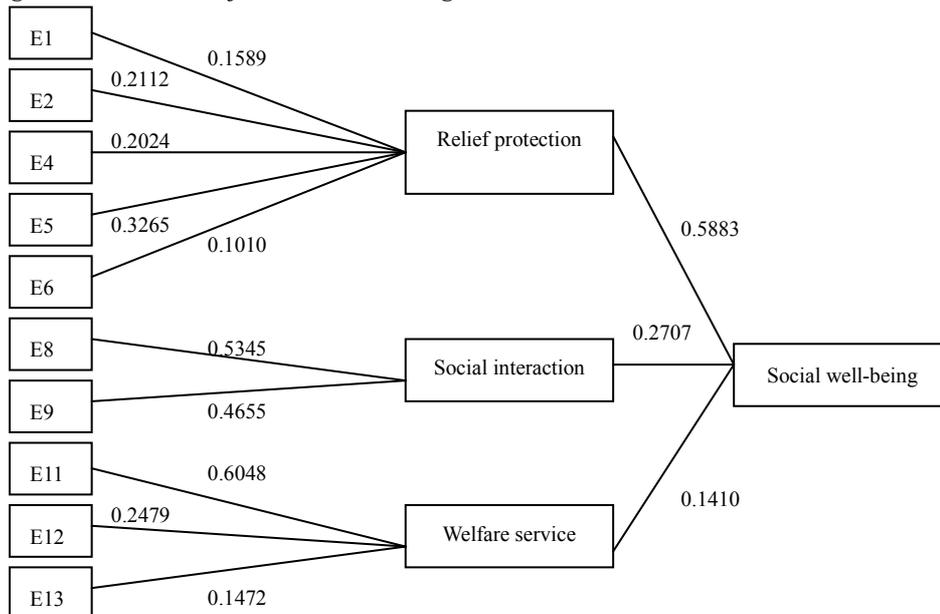


Fig. 9 Causal model of social well-being

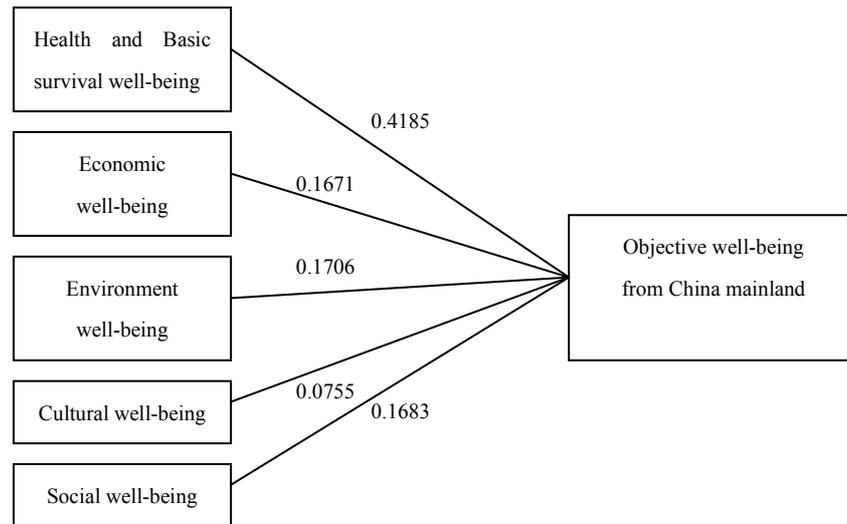


Fig. 10 Causal model of objective well-being from China mainland

3.3.2 Principal Component Analysis

There is no doubt that the AHP is a good approach to obtain the qualitative indicators. However, this approach has difficulty in reflecting the relationship of indicators each other, so in this step we used the Principal Component Analysis (PCA) to compensate for this limitation of AHP. The PCA is a multivariate statistical method for selecting the major factor from the objective data based on the variance to the target of an evaluation (Jolliffe, 2002). Regarding this principle of the PCA, first of all, we made transformation of 46 dimensionless indicators through weighted treatment through the following formulas:

$$X_i^* = W_i X_i \quad (i=1, 2, 3\dots)$$

Where X_i^* is the new data for each indicator to be transformed by the weighted treatment, W_i is the weight for each indicator obtained from the AHP in last step, X_i is the dimensionless data. Then the PCA analysis involves three basic steps was made to this new database (there is a new corresponding data from 30 provinces in China mainland during 2004-2008 for each indicator), and these steps were shown by the example of the ‘Health’, a sub-classification from health and basic survival well-being:

(1) Principal component extraction. According the principle of multivariate statistical analysis, if the contribution rate of the first k principal components reach 85%, it shows that these k components contains the basic information of all indicators. The contribution rate of variance here means the relative importance of each major component (Jolliffe, 2002). In order to make each principal component extracted reflects one single quality to the greatest extent, we did the extraction for each sub-classifications of major domains. From the extraction by SPSS 15.0 on computer, we got two major components for health, and they contains 87.06% information of this part.

(2) Computing score for every major component. In this stage, initial principal component analysis, eigenvalue and contribution rate were taken into account to get an expression for each major component. Firstly, the eigenvectors were computed by following formula:

$$a_{jl} = \sqrt{\frac{\mu_{jl}}{\lambda_l}} \quad (j=1, 2 \dots p; l=1, 2 \dots k)$$

Where μ_{jl} is the initial loading value of the j th indicator corresponding to the l th factor (**Table 3** shows the initial loading values of ‘Health’), while λ_l is the eigenvalue corresponding to the l th factor. Secondly, we got the expressions of two major components or facets for ‘Health’ as follows:

$$F_1 = \mu_1 W_1 X_1 + \mu_2 W_2 X_2 + \mu_3 W_3 X_3 + \mu_4 W_4 X_4$$

$$F_2 = \mu_1 W_1 X_1 - \mu_2 W_2 X_2 - \mu_3 W_3 X_3 + \mu_4 W_4 X_4$$

Table 3 Component Matrix (Health)

	Component	
	1	2
1(A1)	.643	.745
2(A2)	.876	-.193
3(A3)	.826	-.438
4(A4)	.912	.058

Thirdly, the score of fact F_1 adds the score of F_2 is the evaluation score of ‘Health’. Then, we could get the evaluation score of another sub-classification of Health and basic survival well-being by the same steps. Meanwhile, these two score together is the score of Health and basic survival well-being.

Through the approach and procedures above-mentioned we have got the score of each major domain, then the final score of well-being of every province in China mainland was computed through the following formulas:

$$W = 0.4185 \times A + 0.1671 \times B + 0.1706 \times C + 0.0755 \times D + 0.1683 \times E$$

Where W is the final score of objective well-being of every province while the letters A, B, C, D, E are the score of Health and basic survival well-being, Economic well-being, Environment well-being, Cultural well-being and Social well-being of every province respectively. Moreover, every numerical value before every letter is the weight of every major domain obtained from the AHP approach.

3.4 Results

By the process above, namely ACP-PCA approach, we got the scores of objective well-being for 30 provinces in China mainland during 2004-2008 (Owing to the lack of some data, the score of wellbeing for Xizhang Aut.Reg was not computed and was not participate in the final ranking). See in **Table 4** for the final results.

From the results in our research, we could find that the inequalities of objective well-being between different provinces and different regions in China mainland are prominent issues as the economic inequalities that are long-standing here. Moreover, this kind of regional disparity especially exists between the Western and Eastern area in China.

Table 4 the scores of objective well-being for every provinces in China (2004-2008)

Provinces in China mainland	2004	Rank	2005	Rank	2006	Rank	2007	Rank	2008	Rank
Beijing	0.3899	1	0.3824	1	0.3965	1	0.3719	1	0.3782	1
Tianjin	0.2634	3	0.2689	3	0.2775	3	0.2786	3	0.2803	3
Heibei	0.1604	16	0.1685	13	0.1708	15	0.1635	17	0.1683	17
Shanxi	0.1723	11	0.1768	11	0.1828	11	0.1755	12	0.1833	11
Inner Mongolia Aut.Reg	0.1577	18	0.1630	17	0.1723	13	0.1682	14	0.1740	14
Liaoning	0.1902	8	0.2029	7	0.2071	8	0.1991	8	0.2080	7
Jilin	0.1886	9	0.1918	9	0.1949	10	0.1915	9	0.1946	10
Heilongjiang	0.1671	12	0.1744	12	0.1775	12	0.1789	11	0.1773	12
Shanghai	0.3274	2	0.3358	2	0.3428	2	0.3497	2	0.3500	2
Jiangsu	0.2102	6	0.2223	6	0.2323	6	0.2282	6	0.2336	6
Zhejiang	0.2398	4	0.2574	4	0.2622	4	0.2582	4	0.2602	4
Anhui	0.1347	26	0.1396	26	0.1503	24	0.1405	25	0.1494	26
Fujian	0.1846	10	0.1915	10	0.1982	9	0.1911	10	0.1992	9
Jiangxi	0.1446	23	0.1543	21	0.1570	23	0.1555	21	0.1648	19
Shandong	0.1908	7	0.1990	8	0.2110	7	0.2054	7	0.2054	8
Henan	0.1450	21	0.1511	23	0.1583	22	0.1545	22	0.1577	21
Hubei	0.1621	13	0.1661	14	0.1716	14	0.1642	16	0.1669	18
Hunan	0.1456	20	0.1548	20	0.1625	20	0.1565	20	0.1641	20
Guangdong	0.2244	5	0.2308	5	0.2351	5	0.2308	5	0.2366	5
Guangxi Zhuang Aut.Reg	0.1449	22	0.1536	22	0.1593	21	0.1479	23	0.1518	25
Hainan	0.1602	17	0.1617	19	0.1634	19	0.1712	13	0.1754	13
Chongqing	0.1472	19	0.1621	18	0.1658	18	0.1648	15	0.1722	15
Sichuan	0.1307	27	0.1341	27	0.1398	27	0.1393	26	0.1522	22
Guizhou	0.1024	30	0.1115	30	0.1121	30	0.1037	30	0.0996	30
Yunnan	0.1096	29	0.1170	29	0.1198	29	0.1215	29	0.1296	28
Shaanxi	0.1426	24	0.1440	24	0.1465	25	0.1444	24	0.1525	23
Gansu	0.1294	28	0.1329	28	0.1319	28	0.1263	28	0.1306	29
Qinghai	0.1361	25	0.1397	25	0.1458	26	0.1358	27	0.1386	27
Ningxia Hui Aut.Reg	0.1618	15	0.1649	15	0.1697	16	0.1625	18	0.1717	16
Xinjiang Uygur Aut.Reg	0.1621	14	0.1645	16	0.1696	17	0.1567	19	0.1530	22

4. Conclusion and Discussion

Through constructing the comprehensive concept of well-being, this research is an attempt to compositing with objective well-being and subjective-wellbeing together. In addition, it introduces the public policy-oriented perspective to the well-being study, which reflects in the concept of well-being, the framework of indicators system, and the criterions of indicators selecting. Furthermore, according to the different disadvanta

ges of subjective weighting approach and objective weighting approach, namely AHP and PCA respectively, this research use a synthesized method into the evaluation of objective well-being. So through this study, we gain experience in constructing the composite well-being index for a developing country. Obviously, since the concept of quality of life is multi-dimensions and involves many indicators, this paper merely presented the result of our research in evaluation of Chinese objective well-being, the subjective indicators should be considered together with the objective indicators as an whole organic system. And this is the future direction of research.

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Abstracts

As a developing country, the study of QOL indices had been initiated since 80s last century in China. Currently, some progress had been made in the research field. For one thing, many researchers defined QOL as a composite structure which included subjective and objective elements. Considerable summary well-being indices had been constructed from different analysis unit (e.g., cities, province, and nations). For another, statistical methods played an important part in determining the weights of these indices, either objective weighting or subjective weighting. This paper defined the concept QOL as the quality of people's being, which used in analyzing the wellbeing of people' living condition and also reflected their subjective well-being to the living condition. Based on this concept, an analytical system of Chinese people's objective well-being was suggested. 115 indices from six aspects reflecting the characteristics of the Chinese people's objective wellbeing had been initially proposed. Economic well-being, Health and Basic survival well-being, Social well-being, Cultural well-being, Environment well-being had been taken into consideration. Through the analysis of content validity of experts and correlation analysis, 46 indices were selected. The weights of the subjective and objective indices were determined through analytic hierarchy process (AHP) and principal component method respectively. By combining the weight coefficient obtained from the two approaches, the composite indicator of Chinese people's objective wellbeing was performed and the objective well-being level of 30 Chinese provinces was evaluated.