Measurement and Decomposition of the Promoting Factors on China's Rural Anti-Poverty Performance: 1978–2014

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By using *China Yearbook of Household Survey* and CHIPS' we measure, decompose, and test the pushing factors of rural anti-poverty's performance. We find that the rural poverty rate fell, which benefited from the endogenous reform of land policy from 1978 to 1985, and from 1986 to 1993, China's rural poverty rate was still falling rapidly, when economic growth played a leading role, but the marginal revenue was falling. Although rural areas had implemented development-oriented poverty relief and social relief during the period from 1994 to 2000, the poverty rate decline was not large, because negative effects from redistribution offset the contribution from economic growth. China's rural poverty rate was rising slightly from 2001 to 2014, because the positive contribution from economic growth was falling and the effects from income distribution originated from poverty reduction aiming mechanism were low, which led to a falling composite contribution rate. Throughout the 30 years' strategy and path of anti-poverty, we find that economic growth has been playing the dominant role, and as the poverty rate and poverty gap rebound, the contribution from income distribution and redistribution in reducing poverty will rise. The government should increase investment in rural public products and public services to optimize the path and strategy of rural anti-poverty.

Keywords: anti-poverty, pushing factors, contribution rate, development-oriented poverty reduction

1. Introduction

Since 1978, China's rural anti-poverty strategy experienced the endogenous reform of household land contract responsibility system (1978–1985) to the sudden rise of the development-oriented poverty reduction (1986–1993), and then to the combination of development-oriented poverty reduction and social relief policy (1994–2000), finally evolved to anti-poverty aiming mechanism of "from county to village" (2001–2014) and "targeted" poverty reduction model since 2015. This series of anti-poverty strategies and rapid economic growth have resulted in the total number of absolute poverty in rural China decreasing from 250 million in 1978 (accounting for 31.65%

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of the total rural population) to 70.17 million (7.20% of the total rural population). The achievement of China's rural anti-poverty strategy and practice is recognized by the world. The reduction of global deep poverty population is mainly the reduction of deep poverty population in China, which is a significant contribution from China to human development. The anti-poverty strategy which combines the practice of rural development and the employment as well as development of poor families in rural areas has played a key role in reducing poverty. Poverty is a social "cancer" which has different forms in different stages, so the anti-poverty strategy needs to be adjusted according to the "cause". When facing the government's heterogeneous anti-poverty strategy in different stages and the astonishing speed of poverty reduction, we cannot help but to ask: in the "total factor" of anti-poverty strategy, how much is the relative contribution rate of each factor? Which factors make the greatest contribution to reducing poverty in rural areas? This paper will measure and decompose these factors.

For this reason, this paper uses CHIPS and *China Yearbook of Household Survey* of relevant years to study the following issues: (1) we analyze and screen pushing factors of rural anti-poverty performance in five different stages according to China's economic, social and political changes respectively; (2) we classify all kinds of rural poverty reduction policies, further explore the contribution rate of composite effects of various kinds of anti-poverty policies to anti-poverty performance; (3) we conduct non-parametric decomposition of effect of factors such as economic growth factors, income distribution factors and income redistribution factors which influencing income of rural residents on reducing rural poverty rate.

2. Data Sources and Research Methods

2.1. Data Sources

2.1.1. Data Sources

The data of this paper consists of three parts: (1) *Survey Data of the Peasant Household of the National Bureau of Statistics* from 1980 to 1987; (2) CHIPS of 1988, 1995, 2002 and 2008; (3) *China Yearbook of Household Survey* from 2009 to 2015. Because there are great differences in prices among different rural areas, this paper dynamically adjusted the price data in different regions according to the price index in different regions in China.[1] Relevant literature and government documents show that Chinese anti-poverty process can be divided into the following stages: the first stage was from 1978 to1985 which was the stage of rural system reform, this

[1] This paper refers to Brandt and Holz (2006), Xia, Song and Appleton (2010) when processing the data.

paper uses the rural survey data of the National Bureau of Statistics of this period; the second stage was from 1986 to 1993 which was the stage of development-oriented poverty reduction, the rural survey data from the National Bureau of statistics of 1986 and 1987 and data from the CHIPS database of 1988 to 1993 were used; the fourth stage was from 2001 to 2006, the fifth stage was from 2007 to 2014, the data from the CHIPS from 2001 to 2008 and data from *China Yearbook of Household Survey* from 2009 to 2014 were used.

2.1.2. Node Selection

In terms of selecting nodes: (1) The National Bureau of Statistics started the survey of farmers in 1980, from the perspective of rural system reform such as the full implementation of the rural land contract responsibility system, which is also in 1980. Therefore, it is reasonable to select the year 1978 as the starting point. (2) Some scholars merged 1986–1993 and 1994–2000 into one stage mainly because there were only differences in scale and direction of investment of poverty reduction fund; but this paper believes that there were sudden changes of economic system and structure such as the emergence of migrant workers and the rise of township enterprise which had impact on rural poverty rate after the "Deng Xiaoping's southern tour speech" in 1992, so it should be divided into two stages. For the fifth stage, the focus of Chinese anti-poverty shifted to rural areas again, with the implementation of intensive anti-poverty policies, the proportion of rural public finance investment gradually increased, therefore, the focus of anti-poverty policy began to shift from initial distribution to redistribution. In view of this, this paper will use the year 2007 as a time node, to divide measurement and decomposition of pushing factors of anti-poverty policy performance into 5 stages.

2.2. Measurement and Decomposition Model of Pushing Factors of Anti-Poverty Performance

The existing indices to measure poverty mainly include poverty rate, poverty gap, Sen poverty index and FGT poverty index. These poverty indices can be used to measure the degree of poverty in different regions during different time intervals. However, from the perspective of explanatory power of poverty, all of them have some limitations because a single index can only measure the anti-poverty situation in one aspect and it is difficult to interpret intuitively. As the phenomenon of poverty itself is very complex, using one single poverty index to measure poverty is the same as describing a stereoscopic geometric figure with a point. Therefore, in order to comprehensively measure the pushing factors of rural anti-poverty performance and examine the contribution rate of various factors, this paper decomposes some

comprehensive anti-poverty index and obtains the contribution rate of decomposition factors to rural anti-poverty performance.

2.2.1. Measurement and Decomposition Model of the Poverty Tolerance Index (PTI)

Poverty tolerance index refers to the ratio of poverty gap (the amount below the poverty standard) to national income (GNI), which means the ability of the whole society to tolerate poverty. The larger the index, the heavier the social poverty burden is, and vice versa. PTI represents the poverty tolerance index and PG represents the total poverty gap, so:

$$PTI = \frac{PG}{GNI} = \frac{p(y - \overline{y_q})}{mx} = \frac{p}{m} \times \frac{y - \overline{y_q}}{y} \times \frac{y}{x} = O \times R \times S \quad (1)$$

In Equation (1), y represents the rural poverty line, $\overline{y_q}$ represents average income of the rural poor, p represents the total number of rural poverty population, $\overline{x}$ represents per capita income of rural population, m represents the total rural population, x represents individual income, $S = \frac{y}{\overline{x}}$ represents the ratio of poverty line to individual income, which reflects the degree of average poverty of rural poverty population accounting for the total rural population and represents the poverty line index, $S \in [0,1]$, S=1 representing all rural social population are poor, if the dynamic sequence of S is decreasing, it means that the relative poverty reduction degree is in continuous improvement;[1] O represents poverty rate; I represents poverty gap. The logarithm of Equation (1) is taken as the bottom of e, and the next equation is obtained:

$$\ln(PTI)_t = \ln O_t + \ln R_t + \ln S_t \quad (2)$$

$$\ln(PTI)_t - \ln(PTI)_{t-1} = (\ln O_t - \ln O_{t-1}) + (\ln R_t - \ln R_{t-1}) + (\ln S_t - \ln S_{t-1}) \quad (3)$$

The logarithmic transformation of Equation (3) is as follows:

$$\ln(PTI_t/PTI_{t-1}) = \ln[1 + (PTI_t - PTI_{t-1})/PTI_{t-1} \approx (PTI_t - PTI_{t-1})/PTI_{t-1} \quad (4)$$

In accordance with the McLaughlin formula, Equation (4) is tenable when PTI_{t-1} is close to PTI_t. And it can be obtained from Equation (4) that with a certain range of relative

[1] When studying relative poverty, we need to assign values for S, for example, S is usually set as a fixed number, then the poverty line is relative poverty line. This value will increase with the increase of average income.

index change rate, the change rate of poverty tolerance index (PTI) is approximately equal to the sum of the change rate of poverty rate, the poverty line index and the change rate of poverty gap.

2.2.2. Decomposition Model of Sen-Shorrocks-Thon Poverty Index (SST Index)

This paper refers to the decomposition of the Sen poverty index conducted by Osberg and Xu (2000) and further decomposes the SST poverty index. z_j represents relative poverty scale of individual j, that is, z_j takes a larger value out of 0 and $(y - x_j)/y$, j=1,2,... m. Then, the SST poverty index can be decomposed into the following form:

$$F_{SST}(X,y) = \frac{1}{m^2}\sum_{j-1}^{p}(2m - 2j + 1) \times \frac{y - x_j}{y} \tag{5}$$

In Equation (5), X represents individual income vector, $X = \{x1, x2,\ldots, x_m\}$, $x1, \leqslant x2, \leqslant,\ldots, x_p, y \leqslant x_p+1 \leqslant,\ldots, \leqslant x_m$, he explanations of variables are the same to Equations (1) ~ (4), so the following equation is tenable.

$$\frac{1}{m^2}\sum_{j-1}^{p}(2m - 2j + 1) \times \frac{y - x_j}{y} = \frac{1}{m^2}\sum_{j-1}^{p}(2m - 2j + 1) \times z_j \tag{6}$$

So Equation (6) can be further transformed into:

$$\frac{1}{m^2}\sum_{j-1}^{p}(2m - 2j + 1) \times z_j = \frac{2m + 1}{m^2} \times \sum_{j=1}^{m} z_j - \frac{2}{m^2}\sum_{j=1}^{m} jz_j = \bar{z}(1 + G_z) \tag{7}$$

Then Equation (8) is tenable.

$$F_{SST}(X,y) = \bar{z} \times (1 + G_z) \tag{8}$$

Where, G_z is Gini coefficient of vector $Z = \{z_m, z_m-1,\ldots, z_2, z_1\}$, and because $\bar{z}=OR$, we have:

$$q(X,y) = OR(1 + G_z) \tag{9}$$

Take logarithmic form of Equation (9):

$$\Delta\ln[F_{SST}(X,y)] = \Delta\ln O + \Delta\ln R + \Delta\ln(G_z + 1) \tag{10}$$

Equation (10) indicates that the change rate of SST poverty index is jointly

determined by the change rate of poverty rate, the change rate of poverty gap, the Gini coefficient of Z and the change rate of the sum of 1.

2.2.3. Decomposition Model of Economic Growth and Income Distribution

Generally speaking, under the condition of constant income distribution, economic growth will alleviate the poverty degree of social population. Similarly, under the condition of certain economic growth, a reasonable income distribution will reduce the poverty degree of social population. For this aspect, scholars have carried out a preliminary study, for example, Datt and Ravallion (1992) divide the change of total population's poverty degree into three kinds of factors: economic growth factors, income distribution factors and unknown factors. Economic growth factors represent the effect of the change of income distribution on the change of poverty degree when Lorenz curve do not change; income distribution factors represent the effect of the change of Lorenz curve on the change of poverty degree when per capita income remains the same, and unknown factors are residuals.

We might as well assume there are two stages: stage 1 and stage 2, $Q(y/w, L)$ is poverty index, so,

$$Q_2 - Q_1 = G(1,2;i) + A(1,2;i) + \pi(1,2;i) \tag{11}$$

In Equation (11), G represents economic growth factors, A represents income distribution factors, π represents residuals, i is base period.

$$G(1,2;i) = Q(y/w_2;L_i) - Q(y/w_1;L_i) \tag{12}$$

$$A(1,2;i) = Q(y/w_i;L_i) - Q(y/w_i;L_i) \tag{13}$$

As long as the marginal effect of per capita income on the poverty index depends on the Lorenz curve L, that is, the marginal effect of Lorenz curve L on the poverty index is related to the per capita income, then the residual term will exist.[1]

2.2.4. Decomposition Model of Income Growth and Income Redistribution

Income redistribution policies such as social relief, social insurance, social welfare, as well as public products and public services such as education, medical treatment and public health play an extremely important role in reducing poverty (Wang, 2015).

[1] That is to say, the poverty index does not conform to the principle of additive separability principle between per capita income and the Lorenz curve L. In general, the relationship between per capita income and the Lorenz curve L during the period of investigation is variable, so the residual term will exist.

In view of this, based on the decomposition method of Datt and Revallion (1992), this paper decomposes the absolute poverty index into income growth factors and income redistribution factors. First, we use the poverty line y, the average income x_t and income redistribution curve vector L_t to characterize the rural poverty index Q_t. The change of the rural poverty index from year t to year $t+m$ can be decomposed into:

$$Q_{t+m} - Q_t = G + RA + \pi \tag{14}$$

Where the calculation equation of income growth factors and income redistribution factors are as follows:

$$G = Q(y/w_{t+m}; L_i) - Q(y/w_t; L_i) \tag{15}$$

$$RA = Q(y/w_1; L_{t+m}) - Q(y/w_t; L_i) \tag{16}$$

3. Rural Economic Growth, Income Distribution, Income Redistribution and Changes of Poverty

3.1. The Trend of Rural Income Growth and Household Income Change

Chinese rural economic growth rate was 8.383%[1] calculated in constant price from 1978 to 2014, according to the CHIPS and data from *China Yearbook of Household Survey* of 2009–2015, the actual annual growth rate of per capita income of rural residents is only 3.872% (Table 1).

Table 1. Economic Growth Rate and Rural Household Income Growth Rate during Different Time Intervals (%)

Year Interval	Rural household income growth rate (Were not adjusted by B-H)	Rural household income growth rate (Adjusted by B-H)	Economic growth rate (Adjusted in constant price)
Stage 1:1978–1985	4.640	2.867	9.023
Stage 2:1986–1993	4.525	3.922	8.425
Stage 3:1994–2000	3.933	4.136	8.206
Stage 4:2001–2006	4.016	3.253	8.177
Stage 5:2007–2014	4.471	3.895	7.650
Total: 1978–2014	4.286	3.872	8.383

Under the situation that income growth rate is far lower than economic growth rate, the rural household total income and income structure have been significantly improved, as shown in Table 2, the annual per capita net income rose from 265.644 yuan in 2007 to 6706.875 yuan in 2014, which increased about 25 times. From the rural household

[1] Calculated according to *China Statistical Yearbook* released by the National Bureau of Statistics.

income structure, the proportion of wage income of total income increased from 6.319% in 1978–1985 to 38.645% in 2007–2014, up to 6.12 times, among which the migrant workers' income was dominant in the total income and its contribution rate to the increase of total income increased from little proportion in 1978–1985 to 80.45% in 2007–2014, while net income from non-enterprise organizations showed a downward trend. The contribution rate of household business operating income to total income increased rapidly from 2.244% in 1978–1985 to 39.674% in 2007–2014. From the change of agricultural income, it showed an opposite trend of decreasing from 91.492% in 1978–1985 to 39.674% in 2007–2014. Other variables such as property income and transfer income also showed different degree of rising trend. Only the government subsidy income was negative in 1978–2006 and became positive until the beginning of 2007, but the contribution rate is still small, which is mainly because of "industry first, agriculture subsidies industry" development strategy since China's reform and opening up. For last ten years, the government redistribution policy gradually inclined to rural areas, "industry nurturing agriculture" strategy makes the contribution rate of government subsidy income to the total income of rural resident begins to be positive and tend to rise.

Table 2. Composition of Income Per Capita of Rural Residents and the Change Rate of Each Part

Composition	1978–1985	1986–1993	1994–2000	2001–2006	2007–2014
1.Annual net income per capita (Yuan)	265.644	1645.475	1915.55	2753.543	6706.875
2. Wage income (%)	6.319	8.590	23.380	31.751	38.645
(1) Net income from working in non-enterprises	6.319	8.203	5.609	5.887	2.988
(2) Net income from working in local enterprises	0.000	0.385	8.425	8.530	7.784
(3) Net income from migrant workers	0.000	0.002	9.346	17.334	27.873
3. Household business operating income (%)	2.244	12.750	13.409	33.841	39.674
4. Net income from agriculture (%)	91.492	72.873	58.145	28.837	7.563
5. Property income (%)	0.000	0.164	0.170	0.503	0.792
(1) Interest revenue and collective dividends	0.000	0.002	0.003	0.004	0.007
(2) Rent income	0.000	0.158	0.154	0.327	0.468
(3) Income from the transfer of contracted land management rights	0.000	0.004	0.013	0.172	0.497
6. Transfer income (%)	0.032	7.853	6.080	7.954	9.630
(1) Income sent or brought by non-family members	0.000	6.563	5.185	6.328	6.434
(2) Given by relatives or friends outside rural areas	0.002	0.930	0.834	0.844	0.049
(3) Pension	0.030	0.360	0.061	0.782	3.147
7. Governmental subsidiary income (%)	–0.087	–2.230	–1.184	–2.886	3.696

Sources: Calculated according to *China Yearbook of Household Survey* and CHIPS. Because data of 1978-1988 didn't distinguish agricultural and non-agricultural income, this paper estimated according to proportions.

3.2. The Trend of Income Distribution of Rural Residents

This section will further examine the change trend of rural residents' income growth at different income levels and analyze the impact of the change trend on poverty. Figure 1 reports the change in the income distribution of rural residents at every decile. The growth rate of rural residents' income showed little difference at every decile in 1986–1993, while the growth rate of the middle and high income groups was slightly higher, but the average per capita income increased by 33.09 percentages during this period. From the change of rural household income growth rate with different economic situation, families at the 20% percentile (also known as the rural poor families) experienced decreasing income growth rate, while families at the 80% percentile (or known as rich families) experienced increasing income growth rate and was higher than that of middle income families (rural families at the 50% percentile) during periods of 1986–1993, 1994–2000, 2001–2006 and 2007–2014.

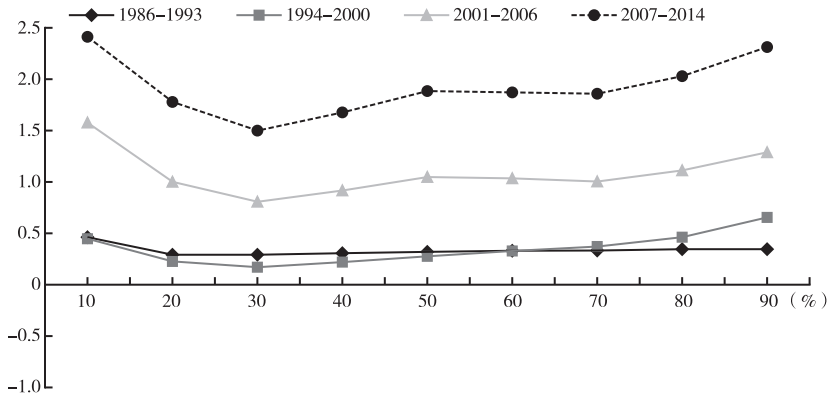

Figure 1. Income Growth Rate of Rural Residents at Different Percentiles in Different Years
Source: Calculated according to *China Yearbook of Household Survey* and CHIPS.

Figure 2 reports the distribution of China rural residents' income distribution gap in different stages in 1978-2014, the income gap increased greatly in the period of 1978–1985 then began to gradually narrow until 1993, and the income distribution gap among rural residents was widened after 1994, then the Chinese rural Gini coefficient has been fluctuating but it has been always more than 0.4. Therefore, the polarization of rural income distribution in China is quite serious since 1994.

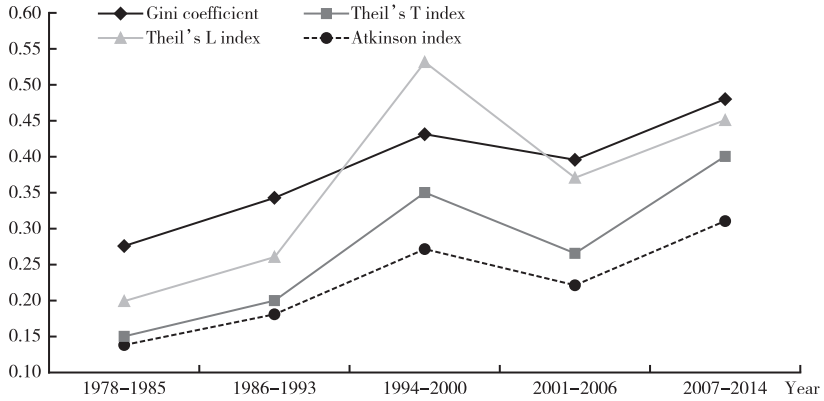

Figure 2. The Distribution of China Rural Residents' Income Distribution Gap in 1978–2014
Source: Calculated according to *China Yearbook of Household Survey* and CHIPS.

3.3. The Trend of Rural Poverty

From the general trend, poverty population scale and poverty rate decreased fastest in stage 1 and stage 2 (Figure 3), the change of poverty population scale and poverty rate was small in stage 4 because the government using a higher low income line replacing the absolute poverty line standard of 1980 in 2008, which led to the increase of the poverty population scale and poverty rate to a certain extent. But in the fifth stage, the poverty population and poverty rate began to decline rapidly since 2010. The main rural poverty index and its logarithmic changes at different stages are shown in Table 3.

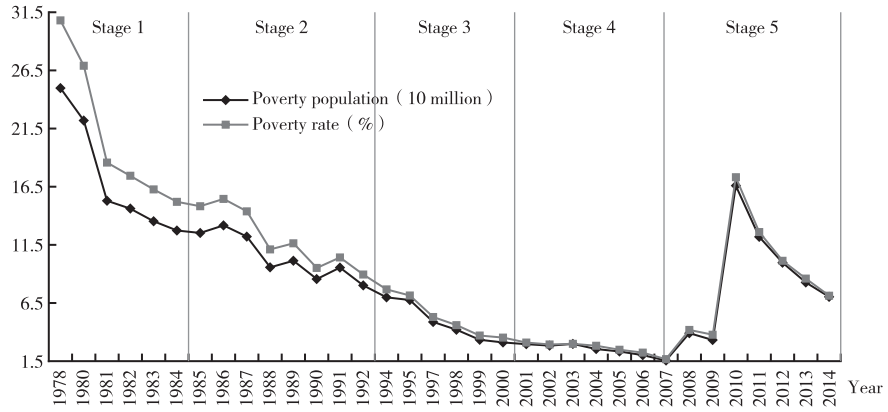

Figure 3. Distribution of China's Rural Poverty Population and Poverty Rate During 1978–2014

Table 3. Major Rural Poverty Index and Its Logarithmic Changes of Different Years (%)

Poverty Index	1978–1985	1986–1993	1994–2000	2001–2006	2007–2014
Poverty Rate	0.234	0.116	0.093	0.023	0.078
Poverty Gap	0.213	0.235	0.262	0.378	0.392
Sen Poverty Index	0.088	0.032	0.021	0.030	0.028
FGT Poverty Index	0.020	0.011	0.009	0.021	0.018
Poverty Line Index	0.740	0.503	0.332	0.273	0.253
Change of Poverty Rate	–0.532	–0.943	–0.516	–0.230	–0.126
Change of Poverty Gap	–0.052	0.193	0.216	0.337	0.370
Change of Poverty Line Index	–0.263	–0.469	–0.502	–0.111	–0.102
Change of PTI	–0.847	–1.219	–0.802	–0.004	0.142
Change of SST Index	–0.542	–0.687	–0.714	0.240	0.263

Source: Calculated according to *China Yearbook of Rural Household Survey*, *China Yearbook of Household Survey* and CHIPS.

Notes: (1) The calculation standard of the FGT poverty index is α=2; (2) All data changes refer to the logarithmic change; (3) The absolute poverty line using the data of official poverty counties announced by the National Bureau of Statistics as the standard, the National Bureau of Statistics replaced absolute poverty line with a higher standard of low income line since the beginning of 2008 to 2009, the government started to use two dollars per day as the poverty line since 2010.

The poverty rate dropped rapidly from 23.04% in the first stage to 11.60% in the second stage, reduced by 50.43%, and the scale of rural poverty population was reduced by more than 100 million. Other indices of poverty such as the Sen poverty index, the poverty gap and the FGT poverty index have decreased by varying degrees. It shows that China's rural anti-poverty policy is effective. In terms of the changes of poverty index of stage 2 to stage 3, the poverty rate decreased from 11.60% to 9.30%, down by 19.83 percentages. Though the effect is not obvious compared with the first stage, from the aspect of the distribution of poverty population, the poverty type and the trend of the poverty reduction policy, the anti-poverty policy is effective. The FGT poverty index and Sen poverty index decreased by 18.18% and 34.38% respectively, which indicates that the depth of rural poverty decreased significantly while the poverty gap increased. It indicates that the severity of poverty in rural areas rose in 1986–1993 and 1994–2000. Therefore, the poverty reduction effect of rural anti-poverty policy during stage 2 and stage 3 was mainly reflected in the reduction of the total number of poverty population not the decrease of poverty severity. The changes of related poverty indices such as the Sen poverty index, the poverty gap and the FGT poverty index have increased respectively at the fourth stage in 2001–2006. The poverty depth and poverty severity have been greatly increased and the poverty in rural areas has deteriorated further. From poverty index of the fifth stage, considering the increase of prices and other factors, the poverty line standard has been raised and the rural poverty rate has increased from 2.3% to 7.8%. The Sen poverty index decreased

from 3% to 2.8%, while the poverty gap increased by 3.30 percentage points, which is relatively lower than that of the previous four stages, indicating that the deterioration of poverty severity has been alleviated. From the SST index and logarithmic changes of five stages (Table 3), the PTI and SST index showed a first decreasing and then increasing trend of "U" type, the increasing trend in the fourth and fifth stages showed that the degree of poverty in rural areas and social burden were on the rise. From the first stage to the third stage, the main indicator of the poverty tolerance index and the SST index is poverty rate. From the perspective of the trend of poverty gap, the role of such an anti-poverty policy is only limited to the decrease of total number of poor population rather than the decrease of poverty in real sense. Therefore, China's rural "poverty-returning" phenomenon is very protruding, the poverty population of some rural areas even shows a "pendulum" rebound. Therefore, we must rethink and evaluate the performance of rural anti-poverty performance in China from a deeper perspective at current stage.

4. Decomposition and Test of Pushing Factors of Rural Anti-Poverty Performance

In order to understand the pushing factors of China's anti-poverty performance thoroughly, this section examines empirical results of decomposition model of factors such as economic growth factors and income distribution factors as well as redistribution respectively. In anti-poverty policies of Chinese rural areas, economic growth policy, income distribution policy and income redistribution in 1978-2014 are shown in Table 4.

Table 5 reports the decomposition results of the contribution rate of the factors (economic growth factors and income distribution factors) of China's rural anti-poverty performance in different years. In different stages, the income distribution factors would lead to a rise of rural poverty index, while the alleviating effect of economic growth factors on rural poverty rate and poverty gap is gradually weakened in general; from the poverty gap of stages 4 and 5, economic growth factors not only haven't reduced rural poverty gap but increased it, which proved the immiserizing growth proposed by Indian economist Bhagwati, that is, the more growth, the poorer namely "tragic growth"; however, the reducing power of index such as rural poverty rate, poverty gap caused by distribution has increased, the most effective period of economic growth factors in alleviating rural poverty are the first three stages, namely 1978–1985, 1986–1993 and 1994–2000. The first stage was rural system reform, that is, the implementation stage of the rural land contract responsibility system which was a major reform of the rural economic system (Table 6). The reform had played a decisive role in the reduction of the overall poverty rate in rural areas.

The second stage was a period of rapid decline of Chinese rural poverty, government began to implement large-scale development-oriented poverty reduction

strategy, combined anti-poverty policy and macroeconomic policy, shifted from the average distribution of poverty reduction funds to allocating funds according to the benefits of the project, to relax the restrictions on transfer between regions among rural residents, to support labor intensive industries. At this stage, the role of economic growth in the alleviation of rural poverty was still dominant, and the role of income distribution and redistribution factors played more important role, the role of the income growth was very close to that of the income redistribution factors in reducing poverty rate.

Table 4. Economic Growth Policies, Income Distribution Policies and Factors of Population Change

Stage	Economic growth policies	Income distribution policies	Income redistribution policies
Stage1: 1978–1985	The household contract responsibility system; adjustment of agricultural products price; special funds to support extreme poverty areas	To obtain agricultural income by land, roughly allocating poverty reduction funds on average	Social relief for special crowd
Stage2: 1986–1993	Comprehensive investment combining money, technology, materials and training programs; poverty reduction by science and technology; preferential credit, preferential finance and taxes; policy of fixed assistance	Allocating funds according to project benefits; work replace funds; wages income; human resources development and training	Social relief for special crowd; rural pension policy (old rural pension)
Stage3: 1994–2000	Poverty reduction loans; poverty reduction and development fund; Eastern counterpart support to the West; preferential credit; international cooperative poverty reduction; allopatric open policy	Work replace funds; wages income; human resources development and training	Social relief for special crowd; the implementation and failure of old pension
Stage4: 2001–2006	International cooperative poverty reduction policy; social poverty reduction fund mobilization policy; allopatric open policy; liberalizing price of agricultural products; exempting income tax of development-oriented enterprise	Special poverty reduction fund; wages income; human resources development and training	Social relief for special crowd; "Hope Project", "rehabilitation and poverty reduction project", "fraternity project"; reform of rural housing
Stage5: 2007–2014	Reducing and exempting agricultural tax; liberalizing price of agricultural products; international cooperative poverty reduction policy; exempting income tax of development-oriented enterprise; development in the field policy; characteristic advantageous industry (1 households 1 project).	Special poverty reduction fund; wages income; human resources development and training; direct subsidies for grain-growing	Rural basic living allowance; rural new pension; rural new cooperative medical system; medical assistance for large diseases in rural areas; reform of rural housing; the three level medical and health network policy in poverty-stricken areas

Sources: The central governments' No. 1 documents every year during 1978–2014; *China Rural Statistical Yearbook* of every year during 1978–2014; *China's Poverty Reduction and Development Yearbook* during 2010–2015.

Table 5. Decomposition of the Contribution Rate of China's Rural Anti-Poverty Performance (Economic Growth and Income Distribution)

Poverty index	All factors	Economic growth	Income distribution	Residual
Stage1: 1978–1985				
Poverty rate	–0.1270	–0.2788	0.0518	0.100
Poverty gap	–0.0118	–0.0952	0.0351	0.0483
Sen poverty index	–0.0455	–0.0811	0.0313	0.0043
FGT poverty index	–0.0071	–0.0193	0.0121	0.0001
Stage2: 1986–1993				
Poverty rate	–0.1020	–0.1010	0.099	–0.100
Poverty gap	0.0643	–0.0122	0.0485	0.0280
Sen poverty index	–0.0115	–0.0291	0.0479	–0.0303
FGT poverty index	–0.0029	–0.0087	0.020	–0.0142
Stage3: 1994–2000				
Poverty rate	–0.1245	–0.1105	0.083	–0.097
Poverty gap	0.0649	–0.0135	0.0530	0.0254
Sen poverty index	–0.0076	–0.0263	0.0527	–0.0340
FGT poverty index	–0.0072	–0.0075	0.014	–0.0137
Stage4: 2001–2006				
Poverty rate	–0.0064	–0.0270	0.0269	–0.0063
Poverty gap	0.1192	0.0363	0.0710	0.0119
Sen poverty index	0.0072	–0.0090	0.0192	–0.0030
FGT poverty index	0.0122	–0.0026	0.0135	0.0013
Stage5: 2007–2014				
Poverty rate	–0.0034	–0.0181	0.0197	–0.0050
Poverty gap	0.1330	0.0376	0.0850	0.0104
Sen poverty index	0.0004	–0.0073	0.0097	–0.0020
FGT poverty index	0.0780	–0.0016	0.0786	0.0010

Notes: The year 1980 is the base year of stage one, the year 1986 is the base year of stage two, the year 1994 is the base year of stage three, the year 2001 is the base year of stage four, the year 2007 is the base year of stage five.

In the third stage, the anti-poverty policy continued the development-oriented anti-poverty model, there were only slight differences in scale and direction and aimed at poverty reduction in some concentrated rural poverty areas. The contribution rate of economic growth factors and income redistribution factors to poverty reduction in this stage was similar to that in the second stage. From the beginning of the third stage, it became normal for rural surplus labor force to work as migrant workers, and rural population structure has undergone major changes because of further promotion of the family planning policy, as for the changes of residuals in Table 6, factors such as family size, the proportion

of urban population to rural population had certain effect on rural anti-poverty performance.

From the input-output efficiency, the contribution rate of income redistribution factors on poverty was far greater than that of economic growth factors in the fourth stage and fifth stage, that is, the negative effect of irrational income distribution exceeded positive effect of economic growth factors for the rural poor population. There was a time that the income gap of Chinese rural residents had been narrowed during 1978–2014, which was stage 3. The income gap was decreasing at this stage, rural poverty would also decrease even if the economic growth rate is zero. The contribution rate of income redistribution factors to rural anti-poverty performance was always positive in 1998–2014, the contribution rate was relative larger at stage 1 and 2. Chinese rural areas implemented a series of redistribution policy such as rural basic living allowance, the new rural cooperative medical system and new rural pension system since 2007. The contribution rate of redistribution factors to poverty reduction has been greatly improved compared to the previous stages. It indicates that for all anti-poverty policies, the role of income distribution factors, income redistribution factors decreased gradually, which was partly due to the structure of poverty population, such as the proportion of the old, week sick and disabled population to rural poverty population was gradually increasing, and party because of rural poverty population distribution, that is, the role of economic growth factors was gradually limited and the redistribution policy played a more and more significant role. Table 5 and Table 6 show that the income growth can reduce poverty, but the large income gap will lead to the rise of the poverty rate again.

Table 6. Decomposition of the Contribution Rate of China's Rural Anti-Poverty Performance (Income Growth and Income Redistribution)

Poverty index	All factors	Income growth	Redistribution	Residual
Stage1: 1978–1985				
Poverty population	1.39%	–5.66%	9.20%	–2.15%
Gap between rich and poor	–0.74%	–1.43%	1.67%	–0.98%
Gap between rich and poor × gap between rich and poor	–1.03%	–0.72%	0.16%	–0.47%
Stage2: 1986–1993				
Poverty population	2.13%	–4.73%	8.75%	–1.89%
Gap between rich and poor	–1.63%	–2.03%	1.25%	–0.85%
Gap between rich and poor × gap between rich and poor	–2.00%	–1.23%	0.20%	–0.97%
Stage3: 1994–2000				
Poverty population	–5.43%	–9.80%	2.53%	1.84%
Gap between rich and poor	–3.12%	–2.91%	–0.69%	0.48%
Gap between rich and poor × gap between rich and poor	–1.40%	–0.25%	0.19%	–1.34%

Poverty index	All factors	Income growth	Redistribution	Residual
Stage4: 2001–2006				
Poverty population	–9.79%	–11.23%	5.79%	–4.35%
Gap between rich and poor	–3.38%	–2.79%	1.13%	–1.72%
Gap between rich and poor × gap between rich and poor	–2.38%	–1.35%	–0.26%	–0.77%
Stage5: 2007–2014				
Poverty population	–9.11%	–11.96%	6.70%	–3.85%
Gap between rich and poor	–3.44%	–2.76%	0.98%	–1.66%
Gap between rich and poor × gap between rich and poor	–2.26%	–1.28%	–0.27%	–0.71%

Notes: The year 1980 is the base year of stage one, the year 1986 is the base year of stage two, the year 1994 is the base year of stage three, the year 2001 is the base year of stage four, the year 2007 is the base year of stage five.

5. Conclusion and Evaluation

From the rural land contract responsibility system to the large-scale development-oriented poverty reduction, from critical stage of poverty reduction to aiming poverty reduction of "from county to village", from the implementation of redistribution policy with "the new rural basic living allowance + new rural cooperative medical system + new rural pension system" to "targeted" poverty reduction in 2015, China's rural anti-poverty of "government model" has implemented nearly forty years. The management system of rural anti-poverty organization is unique in the world. No country or region regards anti-poverty as a major task and responsibility of the government among more than 200 countries and regions in the world. China's unique governmental anti-poverty governance model as well as its leading role in anti-poverty strategy and path shows its unique advantages in the process of rural anti-poverty. Through the decomposition and measurement of related factors, this paper analyzes the effect of poverty reduction of various related factors in different stages of poverty reduction. The parametric and non-parametric test decomposition and test of pushing factors of rural anti-poverty performance show as follows.

(1) The total number of absolute poverty in China's rural areas has decreased significantly from 1978 to 2014. However, from the decomposition trend of poverty intensity in five stages, the severity of rural poverty is gradually increasing. In general, this is mainly because poverty reduction in China over the past thirty years was extensive, the main beneficiaries of rural anti-poverty funds and policies are not entirely rural poor groups, and the flow of rural development-oriented poverty reduction fund is not entirely for the leading enterprise of poverty reduction (Wang, 2012).

(2) According to the contribution rate of economic growth factors, income distribution factors and income redistribution factors to rural anti-poverty performance

at different stages, the effect of economic growth factors on rural poverty and poverty gap rate decreasing. From the results of stage four and stage five, the economic growth factors not only didn't reduce the rural poverty rate, but promoted it, while the effects of factors of income distribution and income redistribution on rural poverty rate and poverty gap have increased rapidly. It shows that the "bonus" of economic growth to alleviate poverty in rural areas has been wiped out even been negative especially in the fifth stage. On one hand, it is related to the structure of the rural poverty population such as the proportion of old, weak, sick and disabled people to the rural population is increasing; on the other hand, it is also related to the regional distribution of rural poverty population, rural poverty in the "contiguous" area gradually reduced, leaving the "sporadic" poor households. Therefore, the factors of income distribution and redistribution are playing a more and more significant role. Moreover, this paper's estimation and the decomposition results also showed that during stage 3 to stage 5, the income gap of rural residents was declining even if the economic growth rate is zero, so the poverty rate in rural areas would still be reduced, and the contribution rate of income redistribution factors to rural anti-poverty performance is higher than the previous four stages in stage 5. It is mainly because the implementation of a series of redistribution policies in rural areas such as the rural basic living allowance, the new rural cooperative medical system and the new rural social pension system, the rural serious illness medical assistance, and the educational assistance since 2007,

Since 2014, the focus of China's income distribution and redistribution has been shifted to rural areas. The issue of agriculture, rural areas and farmers has become the focus of the government's attention because there is no national well-off without well-off society in rural areas. In 2015, a new stage of poverty reduction has begun, which is different from the first five stages, the typical characteristics of the new stage of poverty reduction is "targeted" which is symmetric to extensive poverty reduction, factors of income distribution and redistribution have been integrated into the concept of poverty reduction at new stage from the poverty reduction model and trends. This paper calculates, decomposes and analyzes the pushing factors of rural anti-poverty performance in five stages, aiming to provide some reference for poverty reduction at the new stage, which is also the keynote of this paper.

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