

## Article

# Heterogeneity Perspective on the Dynamic Identification of Low-Income Groups and Quantitative Decomposition of Income Increase: Evidence from China

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**Abstract:** Common prosperity is an essential requirement of socialism. To achieve common prosperity, unbalanced urban–rural development, insufficient regional development, and progressively increasing income disparity between groups must be solved. The measure of raising the low and expanding the middle is receiving more and more attention in gradually achieving common prosperity. In order to formulate long-term income increase strategies for low-income groups with regional characteristics, this article, based on income group data, uses the weak relative poverty criterion to dynamically identify low-income groups and decomposes the changes in the income increase in low-income groups from urban–rural, regional and provincial perspectives to explore the causes and the extent of their influence on the income increase in low-income groups. This paper concludes that the size of low-income groups is generally on a declining trend, while the size of urban low-income groups has increased. Inequality in income distribution reduces the income increase in low-income groups; individual heterogeneity is a key factor that promotes the income increase in low-income groups. It is more difficult to increase the income of low-income groups in central and western rural areas than in eastern rural areas. In the future, on the basis of classifying the paths of income increase for low-income groups in provincial districts and implementing the corresponding income increase policies by combining the characteristics of different categories, it helps to formulate a long-term income increase mechanism for low-income groups that combines the characteristics of regional development and meets the actual regional development. It will promote the long-term income increase in low-income groups and gradually realize common prosperity.

**Keywords:** low-income groups; raising the low and expanding the middle; common prosperity



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## 1. Introduction

Since the 21st century, Chinese gross domestic product has rapidly grown, and the income level of residents has increased to a certain extent. However, the Gini coefficient, typically a single aggregate inequality index, is used, and the measure that has received the most attention has long exceeded the international alert line of 0.4 [1]. Thus, the gradual widening of the gap between the rich and the poor has led to a more visible trend of social polarization. From 2013 to 2019, the income gap between high- and low-income groups nationwide has remained at more than ten times, which has seriously damaged the sense of well-being and access of low-income groups. The lack of security of low-income groups is easy to intensify intergroup conflicts and to induce social risks. Promoting income increases for low-income groups is an effective way to solve the excessive income disparity. During poverty eradication, poverty governance mainly focuses on absolute poverty and has to some extent neglected low-income groups. After the task of poverty eradication is accomplished, the focal point of the rural revitalization stage is to prevent poverty return and promote income increases for low-income groups. Intuitively, at this stage, 30–40% of the Chinese population still belongs to the low-income group, and promoting income increases for this group is a critical way to expand the size of the middle-income group

and form an “olive-shaped” social structure with the middle-income group as the primary group [2,3]. China’s poverty governance is in transition, and the research on the definition of low-income groups and the paths to increase income is still at the preliminary stage. This paper hopes to analyze in depth the paths to increasing the income of low-income groups based on measuring the scale of low-income groups, intending to promote long-term income increases in low-income groups, and lay a solid foundation for realizing rural revitalization and promoting common prosperity.

However, low-income groups face a puzzle in promoting income increases, which is largely accountable to the definition of low-income groups. Low income is a relative concept, ignoring the development and affluence of a country or region, which are always some people with relatively low income [4]. Currently, most countries define low-income groups by monetary income and achieve good results in practice. Numerous papers have demonstrated that there are many methods to delineate low-income groups, such as the poverty line extension method, the absolute value method, the proportional method, and other absolute criteria [5,6]. The expansion of the poverty line method is to identify a level of income that can guarantee the most basic needs of individuals, which is the poverty line, and income levels below the poverty line are considered low-income groups or the poverty line can be expanded by a certain percentage, for example, to 112%, 125%, 123% or 150%, and more. Second, the minimum wage of a region or city is regarded as the criterion for judging the low-income group, or one-half or one-third of the overall average income is adopted as the low-income line. Similarly, low income is defined as the group whose per capita income is higher than the minimum livelihood security and is less than a certain multiple of the minimum subsistence guarantee (usually 1.5 times), or directly defined as all groups below a certain multiple of the low insurance standard. The low-income group in various statistical yearbooks and statistics in China is divided by all household incomes in quintiles, and households in the bottom 20% are low-income households, which commonly refer to the low-income group as the population whose per capita household income is below the low-income line.

The size and internal structure of low-income groups are changing all the time; thus, low-income groups are a dynamic concept, and the dynamic identification and measurement of low-income groups can better reflect their essence. The dynamic nature of low-income groups determines that their criteria should be adjusted dynamically. The use of relative criteria to define low-income groups can reflect the impact of changes in income distribution on the proportion of low-income groups. At present, the relative criterion that is used most is to rank the income of residents from high to low and to determine a certain proportion of them as the low-income groups, while the relative criterion is constant at a fixed proportion of income, does not truly reflect the situation of low-income groups. The weak relative criterion, proposed by Martin and Chen, integrates the cost of social integration and the absolute and relative nature of consumption or income. The weak relative criterion is, therefore, subject to changes in income levels, Gini coefficients, and income distribution of countries or regions, paying more attention to the measurement of individual social resource differences behind income growth [7], which has its unique advantages in the identification of low-income groups [8].

For the bulk of the literature, there are two significantly different views of economic growth and income distribution on income increases for low-income groups. The inclusive or “trickle-down” effect of economic growth will enable low-income groups to obtain more development fruits from economic growth, thus improving the socio-economic situation of low-income groups. Conversely, high-income groups have the advantages of human capital, social capital, physical capital, and other factors, thus sharing more fruits of economic development, further widening the income gap [6]. Differences in economic growth and income distribution patterns between urban and rural areas, regions, and areas have resulted in unbalanced urban and rural development, inadequate regional development, and widening regional income disparities. The income gap due to urban–rural differences has reduced in recent years. The urban–rural gap has caused urban and rural residents to

show different income growth trajectories, and the migration of rural low-income groups to urban areas for work remains an effective channel for most rural low-income groups to increase their income at present [9]. The siphoning effect of developed regions leads to a dilemma of income increasing in less-developed districts, which is an important factor causing the disparity in regional economic development.

Previously, scholars have paid more attention to the role of the external environment in increasing the income of low-income groups and have somewhat neglected the opportunities and abilities of low-income groups to achieve income increases. This is different from a series of “guaranteed” poverty alleviation policies implemented in the stage of poverty eradication. Low-income groups pay more attention to their endogenous dynamics and sustainable development and rely more on and make use of their comparative advantages to increase their income. At the present stage, the biggest dilemmas that low-income groups face are micro-individual factors. Ability is more important than opportunity for low-income groups. Good health is the guarantee for realizing income increases. Since low-income groups face greater health vulnerability and risk of poverty due to illness and return to poverty due to illness, the impact of health status cannot be ignored. There is also evidence that health matters in regard to how much impact increasing the income of low-income groups has [10–12]. Improving income after having a healthy body is mainly achieved by enhancing education levels, enriching work experiences, and increasing vocational skills. As an effective way to interrupt the intergenerational transmission of poverty, education level also plays an essential role in increasing the income of low-income groups. Improving the level of education in the context of the digital economy can gain more development results from the development of the digital economy, e-commerce development has a significant contribution to the income of rural low-income groups [13], and digital inclusivity has a remarkable poverty reduction effect [14]. Extensive work experience and the enhancement of vocational skills help low-income groups participate in non-farm employment [15], and non-farm employment is another effective channel for low-income groups to achieve income growth.

Motivated by these theoretical arguments, a subset of the empirical literature on the classification of low-income groups mainly uses absolute criteria. There is few literature that uses weak relative criteria and considers the differences in individual social resources behind income growth. Another strand of the literature has argued that the key to income increase for low-income groups is to achieve economic growth and improve income distribution, which to some extent ignores the role of individual heterogeneity on income increase. As there is some variation in the distribution system of low-income groups between regions, their development patterns and trajectories are different, and thus, the paths to income generation for low-income groups are also varied. While the existing literature about improving the income of low-income groups has focused mainly on the national or urban–rural level, which to some extent ignores the differences between regions, the income increase combining with regional characteristics is more targeted and more in line with the actual regional development, considering the practical experience of poverty eradication. It is necessary to classify and manage regions according to the factors affecting the income of low-income groups and the degree of their contribution. Formulating a long-term mechanism for increasing the income of low-income groups suitable for regional development can thereby speed up the realization of an “olive-shaped” social structure in China and can achieve common prosperity at an early date.

After a review of the literature in the above section, theoretical analysis and research hypothesis are reported in Section 2, the research methods and data sources are described in Section 3, while Section 4 measures the poverty dynamics of low-income groups. Section 5 demonstrates the quantification and decomposition of low-income groups for income increase. The main conclusions and recommendations are then presented in Section 6.

## 2. Theoretical Analysis and Research Hypothesis

In China, economic growth and social development are the main drivers of poverty alleviation [16]. There are two main views on the relationship between economic growth and poverty. One is that economic development has a significant “trickle-down” and “diffusion effect” and hence can have an anti-poverty effect [17]. In the process of economic growth, wealth accumulated by groups or regions with priority development will “trickle-down” to poor people or regions through consumption, employment, capital lending, etc., i.e., economic growth can automatically benefit all groups—poverty can also benefit from it [18]. However, there are also views that economic growth cannot automatically “trickle down” to the poorest people. As a result of growth, the absolute state of the poor will tend to worsen. The reason is that economic growth is accompanied by a widening of income disparities and a deterioration in income distribution that counteracts the poverty-reducing effects of growth. Scholars generally agree that economic growth is more effective in reducing poverty in most regions of China [19]. In recent years, with the slowdown of China’s economic growth, the poverty reduction effect of economic growth has gradually slowed down and showed significant regional differences, and precise poverty alleviation is a necessary measure to offset the decline of the poverty reduction effect of the economy [20].

Economic growth is a necessary but not sufficient condition for poverty reduction, and the poverty-reducing effect of economic growth depends not only on the rate of economic growth but also on income distribution [21]. If no attention is paid to income distribution, even if the economy grows, there may be consequences of increased poverty. As Luo Chuliang pointed out, if the widening income gap in the process of economic growth manifests itself as a decline in the income of low-income people, there is even the possibility of economic growth coexisting with an increase in poverty [22]. As China’s economy continues to grow, the income level of residents is increasing, but the inequality of income distribution is also worsening. The worsening income distribution, in turn, can cause low-income groups to benefit less from growth than middle- and high-income groups, resulting in the poverty-reducing effects of economic growth that are partially or fully offset by increased inequality in income distribution [23]. The root cause of worsening poverty by income distribution is the lack of opportunity and ability of poor groups to share in the fruits of economic growth manifested. The opportunity and ability to share the fruits of the economy determines the position of a given group in the income distribution pattern, and because it cannot share the fruits of the economy, the income gap grows, which in turn leads to a cycle of poverty [24].

In addition to economic growth and income distribution, individual heterogeneity is a factor that cannot be ignored as a cause of the variation in poverty, because individual heterogeneity reflects the micro-individual elements that individuals possess to increase their income or escape from poverty, which cannot be captured by economic growth and income distribution. Individual heterogeneity is mainly composed of micro-individual factors such as health status, education, work experience, and family size. Unlike economic growth and income distribution, individual heterogeneity reflects the impact of individual microfactors on poverty status. The effect of individual heterogeneity on income has been ignored for a long time because it is not directly measurable. Personal health is a significant cause of poverty, and the better the health status, the less likely one is to be in poverty. In general, the less educated an individual is, the less resilient or more vulnerable that individual is to poverty. The smaller the household size, the lower the likelihood of falling into poverty. Having non-farm work experience, having children, and having pension insurance are helpful in lifting the poor out of poverty [25].

There is a large gap between the urban and rural levels of economic development in China, and the gap between urban and rural low-income groups is remarkable. Therefore, if the income increase in low-income groups and its influencing factors are viewed as a whole in urban and rural areas, it may give rise to the problem of underestimating urban low-income groups and overestimating rural low-income groups [26]. Based on the national level, sub-regional heterogeneity analysis is often a part of the research focus

since the eastern region is stronger than the central and western regions in terms of the institutional environment, geographical location, and human capital accumulation and marketization [27]. From the historical experience of poverty reduction in China for more than 40 years, the different resource endowments, initial levels of economic development, and geographic and administrative characteristics possessed by each region have led to significant regional differences in the policy effects of poverty alleviation and development [28]. Compared with the study of low-income group problems at the urban–rural and regional levels, the exploration of the factors influencing the income increase in low-income groups in the context of the development status of each province is more refined and is a specific reference for each province to formulate strategies to increase the income of low-income groups according to its situation. Analysis of the factors influencing the income increase in low-income groups at the national level will ignore the differences between different regions, and the conclusions obtained will neglect practical and helpful information, which may lead to the policy guidance meaning of various regions not being relevant or even producing large deviations. Therefore, it is necessary to decompose the influencing factors of income increase in low-income groups at the urban–rural, regional and provincial levels to provide a basis for formulating a long-term income increase mechanism for low-income groups according to local conditions.

Based on the above analysis, the following hypotheses are proposed:

**Hypothesis 1.** *With constant income distribution and individual heterogeneity, economic growth contributes to poverty reduction, and the poverty reduction effect of economic growth is heterogeneous.*

**Hypothesis 2.** *With economic growth and individual heterogeneity held constant, the improvement in income distribution is conducive to poverty reduction, and the poverty alleviation effect of income distribution is heterogeneous.*

**Hypothesis 3.** *When economic growth and income distribution remain unchanged, the improvement of individual heterogeneity is beneficial to poverty reduction.*

**Hypothesis 4.** *When economic growth, income distribution, and individual heterogeneity combine with poverty, the effect of poverty reduction depends on the relative strengths of the three factors. If the impact of positive exceeds the negative, poverty is improved. Conversely, if the effect of the negative outweighs the positive, poverty is deepened.*

### 3. Methods and Data Sources

Methods and data sources are the basis for measuring low-income groups and the decomposition of factors influencing income increases. This paper uses the weak relative poverty criterion based on the Gini coefficient to measure low-income groups and the FGT index to measure the status of low-income groups. The poverty decomposition method of Datt and Ravallion is used as a reference to decompose the factors influencing the income increase in low-income groups, and the specific research methods and data sources used are described below.

#### 3.1. Methods

The above abundant theoretical analysis illustrates that the measurement of the size of low-income groups is built on the Gini coefficient. In terms of calculating the Gini coefficient at the provincial level in China, Tian Weimin's calculation method is the most broadly used, and here, we adopt it [29].

$$G = 1 - \frac{1}{PW} \sum_{i=1}^n (W_{i-1} + W_i) \times P_i \quad (1)$$

In Equation (1),  $P$  is the total population,  $W$  is the total income, and  $W_i$  is the income accumulated to group  $i$ . Based on Equation (1), the Gini coefficients of urban and rural



incomes were calculated separately for each province, and then, the Gini coefficient of overall population income was calculated using the “group weighting method” proposed by Sundrum [30].

$$G = P_c^2 \frac{u_c}{u} G_c + P_r^2 \frac{u_r}{u} G_r + P_c P_r \frac{u_c - u_r}{u} \quad (2)$$

In Equation (2),  $G_c$ ,  $G_r$  denotes the Gini coefficient of urban and rural residents' income, respectively;  $P_c$ ,  $P_r$  is the proportion of the urban and rural population, respectively;  $u$  is the per capita income of the province;  $u_c$ ,  $u_r$ , respectively, is the per capita income of urban and rural areas.

Referring to the existing literature, this article uses the objective weak relative criteria proposed by Martin and Chen in defining low-income groups, focusing on the dynamic measurement of low-income groups from an economic perspective [7], which is measured as follows:

$$Z_j^u = \$1.9 + \max[0.7(1 - G)\mu - \$1.00, 0] \quad (3)$$

In Equation (3),  $Z$  is the poverty line,  $Z$  and the subscripts  $u$  and  $j$  denote the upper and lower limits of the poverty line, respectively. The minimum value of the poverty line is \$1.9, adopting the World Bank's proposed \$1.90 per day as the lower poverty line, provides a better measure of the size of the low-income group and facilitates comparison with other countries.  $G$  is the Gini coefficient, and  $\mu$  is the average value of residents' income. Poverty indices for low-income groups in each province are calculated using the FGT index based on the poverty line as follows:

$$P_\alpha(x; z) = \frac{1}{N} \sum_{i=1}^Q \left( \frac{z - x_i}{z} \right)^\alpha; \alpha \geq 0 \quad (4)$$

In Equation (4),  $\alpha$  can take values 0, 1, 2. When  $\alpha$  takes the value of 0, this represents the proportion of the population living below the poverty line ( $P_0$ ), which is also called the headcount index. Poverty is mainly measured by the headcount index. When  $\alpha$  takes the value of 1, this is the depth of poverty, and when  $\alpha$  takes the value of 2, this is the intensity of poverty, denoted by H, PG, and SPG, respectively, where  $z$  is the poverty line in each province,  $N$  is the total population in each province,  $Q$  is the number of poor people in each province, and  $x_i$  denotes the income of the  $i$ th individual.

The decomposability of the poverty index can better explain the degree of influence of each factor on poverty, help to reveal the essence of poverty, enhance the explanatory power of the poverty index, bring into play the role of each element in the anti-poverty policy, and better solve the poverty problem. Variable hypothetical control decomposition and Shapley decomposition are two types of classical poverty index decompositions. The following is a detailed description of the index decomposition. The weak relative criterion, proposed by Martin and Chen, is determined by a combination of disposable income per capita, which reflects economic growth, and the Lorenz curve, which indicates the distribution of income [7]. The poverty in the time  $t$  period can be expressed as:

$$P_{tt} = P(z_t / \mu_t, L_t) \quad (5)$$

In Equation (5), the first  $t$  in  $P_{tt}$  denotes the period corresponding to the income level, and the second  $t$  represents the period corresponding to the income distribution. The poverty change in period 0 and 1 can be represented as:

$$P_{11} - P_{00} = P(z_1 / \mu_1, L_1) - P(z_0 / \mu_0, L_0) \quad (6)$$

The poverty change between periods 0 and 1 in Equation (6) is jointly determined by economic growth and income distribution. To explore the contribution of economic growth and income distribution to poverty change in depth, classically, the factor decomposition is used to decompose the poverty change in the period  $t$  into growth and distribution effects. When the income distribution remains constant between periods 0 and 1, the change in the

poverty index caused by the change in income level is the growth effect. Similarly, in the period between 0 and 1, if the income level is constant, the change in the poverty index due to a change in the income distribution alone is the distributional effect [31]. Here, there are several decompositions of the poverty index for different periods.

The decomposition method proposed by Kakwani and Subbarao is the following equation [32]:

$$P_{11} - P_{00} = (P_{10} - P_{00}) + (P_{11} - P_{10}) \quad (7)$$

The decomposition method proposed by Jain and Tendulkar is the following equation [33]:

$$P_{11} - P_{00} = (P_{11} - P_{01}) + (P_{01} - P_{00}) \quad (8)$$

The above two decomposition methods decompose poverty changes into economic growth effects (first term) and income distribution effects (second term) in periods 0 and 1. However, the reference periods used in the two methods are opposite, which lead to different decomposition of economic growth effects and income distribution effects. Datt and Ravallion anchored both the income levels and the distribution status at the beginning effectively, resolving the controversy [31].

$$P_{11} - P_{00} = (P_{10} - P_{00}) + (P_{01} - P_{00}) + R \quad (9)$$

However, a residual term is added because the above method cannot explain the overall poverty change. Then, many scholars found that the added residual term cannot be explained satisfactorily, and the decomposition method has been criticized. The Shapley decomposition method proposed by Shorrocks sets the reference period as the beginning and the end, respectively, and averages the results of the two calculations obtained. This decomposition method is not affected on the order of calculating, solving the two controversial issues of the reference period and the residual term, and explaining the poverty change well [34].

$$P_{11} - P_{00} = \frac{1}{2}[(P_{10} - P_{00}) + (P_{11} - P_{01})] + \frac{1}{2}[(P_{11} - P_{10}) + (P_{01} - P_{00})] \quad (10)$$

Although the residual term is not easy to interpret, the significant role of the residual term cannot be neglected. It was shown in the study of Autor that residual income mainly depends on the unmeasured portion of income caused by individual-level and household-level heterogeneity, such as educational attainment, work experience, and family size. Shapley decomposition ignores the role of the residual term, which directly affects income inequality and thus poverty trends [35]. The variation caused by the change in the residuals of income when keeping the other terms of income fixed, i.e., the heterogeneity effect, defined by Sun Wei, is better explained by the empirical study for interpreting the residual term as individual heterogeneity, reflected as the heterogeneity effect [36].

Based on Datt and Ravallion's decomposition method, this article interprets the residual term as individual heterogeneity, thus decomposing the poverty change of low-income groups into economic growth effect, income distribution effect, and heterogeneity effect. However, while all these arguments suggest that the income increase depends on the three factors, it is unclear whether growth, distribution, or heterogeneity is the most relevant factor. The decomposition of poverty changes explores whether there are differences in the influencing factors of income increases in low-income groups between urban and rural areas, regions, and districts. There are formulations of long-term income increase mechanisms for low-income groups corresponding to the actual regional development, laying a solid foundation for the realization of rural revitalization and common prosperity.

### 3.2. Data Sources

In keeping with the bulk of the literature, the province is the unit of observations. However, unlike past datasets in the literature on poverty or income increase, this one is

firmly anchored to urban and rural household surveys, in keeping with the focus on the role played by income gains and heterogeneity, which is measured from surveys.

According to Chinese urban–rural “dualistic” structure and the reality of the separation of urban and rural areas in the statistics of resident income and expenditure, this article quotes the data of urban and rural residents’ household income groups originating from the statistical yearbooks and survey yearbooks of each province from 2013 to 2019 to measure the low-income groups. The data on urban and rural income groupings used in this article can be easily obtained from the China Economic and Social Big Data Research Platform (<https://data.cnki.net/Yearbook/Navi?type=type&code=A>, accessed on 16 November 2021), which includes the China Statistical Yearbook and provincial statistical yearbooks for all years. With the availability of the above data, this article takes 20 provinces in China as the subject of research and mainly analyzes the scale of low-income groups. There are urban–rural, regional, and inter-regional differences in the factors affecting the income increase in low-income groups from 2013 to 2019, intending to increase the income of low-income groups, narrowing the urban–rural gap, and achieving “olive-shaped” income distribution and common prosperity.

#### 4. Results

The Gini coefficients calculated based on Equations (1) and (2) are the foundation for measuring low-income groups. The incidence of poverty among low-income groups in the province are calculated using Equations (3) and (4), and the poverty status of low-income groups is analyzed from the perspective of urban–rural separation.

##### 4.1. Provincial Gini Coefficient

The Gini coefficients of each province from 2013 to 2019 are calculated based on the income grouping data of each province combined with Equations (1) and (2), as shown in Table 1.

**Table 1.** Gini coefficient by province from 2013 to 2019.

Region	2013	2014	2015	2016	2017	2018	2019
Beijing	0.2820	0.2749	0.3017	0.2967	0.3000	0.3016	0.3057
Hebei	0.3619	0.3487	0.3471	0.3470	0.3502	0.3644	0.3618
Shanxi	0.3979	0.3903	0.3870	0.3839	0.3786	0.3725	0.3648
Inner Mongolia	0.4077	0.4016	0.3991	0.3902	0.3937	0.3898	0.3829
Jiangsu	0.3636	0.3556	0.3499	0.3441	0.3450	0.3678	0.3721
Anhui	0.3769	0.3672	0.3676	0.3841	0.3905	0.4012	0.3893
Fujian	0.3529	0.3524	0.3479	0.3448	0.3483	0.3697	0.3632
Jiangxi	0.3515	0.3540	0.3463	0.3492	0.3565	0.3865	0.3873
Henan	0.3605	0.3572	0.3598	0.3563	0.3640	0.3725	0.3678
Hubei	0.3479	0.3434	0.3493	0.3581	0.3623	0.3870	0.4020
Guangdong	0.3604	0.3453	0.3299	0.3300	0.3349	0.3426	0.3479
Guangxi	0.4052	0.4025	0.3985	0.3991	0.3974	0.3982	0.3940
Hainan	0.3892	0.3802	0.3745	0.3790	0.3776	0.4087	0.3992
Chongqing	0.3532	0.3512	0.3452	0.3371	0.3393	0.3566	0.3545
Sichuan	0.3795	0.3884	0.3792	0.3880	0.3944	0.4068	0.3873
Guizhou	0.4465	0.4520	0.4524	0.4627	0.4670	0.4984	0.4888
Shanxi	0.4223	0.4160	0.4125	0.4142	0.4123	0.4100	0.4065
Gansu	0.4500	0.4402	0.4522	0.4574	0.4635	0.4800	0.4693
Ningxia	0.3931	0.4272	0.4120	0.4253	0.4195	0.4347	0.4239
Xinjiang	0.3862	0.4010	0.4103	0.4242	0.4249	0.4442	0.4402

Overall, except for Hebei, Shanxi, Inner Mongolia, Guangdong, Guangxi, and Shanxi, all the other provinces had an increasing trend from 2013 to 2019, and the difference in the Gini coefficient reached its maximum value at various times during the study period; thus, the phenomenon indicates that the widening and narrowing of the income gap in each province is not synchronized. In terms of the Gini coefficient of each province, these are



basically in the range of 0.4–0.5, belonging to the higher level of the Gini coefficient in the study period, including Shanxi, Guizhou, Gansu, Ningxia, and Xinjiang. Conversely, the variety of the Gini coefficient indicates that it is necessary to measure the poverty status of low-income groups at the provincial level and analyze its influencing factors. In this way, exploring practical paths to promote the income increase in low-income groups will become easier.

#### 4.2. Provincial Poverty Index for Low-Income Groups

The poverty line in each province from 2013 to 2019 is calculated according to Formula (3), which uses the POVCAL software provided by the World Bank, and the results are shown in Tables 2 and 3.

On the whole, the average incidence of poverty among urban low-income groups in the 20 provinces from 2013 to 2019 was 20.02%, 20.01%, 19.66%, 20.23%, 19.82%, 21.68%, and 21.51%, respectively, and the incidence of poverty among urban low-income groups increased by 1.5%. That is consistent with the reality that Chinese poverty governance has focused on rural areas and neglected urban low-income groups from 2013 to 2019. In the perspective of the incidence of poverty among low-income groups in each province, the provinces of Beijing, Shanxi, Inner Mongolia, Jiangsu, Anhui, Guangxi, Shanxi, and Xinjiang showed a declining trend of the incidence of poverty general; the incidence of poverty in the remaining 12 provinces increased to varying degrees.

The average incidence of poverty among rural low-income groups from 2013 to 2019 was 35.40%, 31.38%, 30.20%, 29.77%, 29.41%, 29.43%, and 27.44%, respectively, which represents an overall decrease of 7.96%. Except for Beijing and Chongqing, where the incidence of poverty among rural low-income groups increased, all other provinces showed the most reducing trend in the incidence of poverty among rural low-income groups, including Gansu, Guizhou, Anhui, Ningxia, and Hubei provinces.

**Table 2.** Incidence of poverty among urban low-income groups by province from 2013 to 2019.

Region	2013	2014	2015	2016	2017	2018	2019
Beijing	23.21	21.68	18.64	17.84	17.36	17.81	17.50
Hebei	19.33	17.17	17.00	17.03	17.26	20.22	23.15
Shanxi	22.48	22.08	21.62	21.70	21.36	20.92	20.66
Inner Mongolia	22.68	21.25	20.67	20.28	20.56	20.60	20.75
Jiangsu	22.63	21.36	20.11	19.63	19.62	20.67	19.99
Anhui	20.58	20.29	19.72	20.56	20.64	21.76	20.04
Fujian	13.00	19.18	18.86	18.32	18.58	19.29	19.03
Jiangxi	16.62	16.83	16.09	16.35	16.67	21.67	20.98
Henan	17.94	10.24	19.50	19.05	19.77	20.20	20.72
Hubei	18.33	19.66	20.09	20.02	20.75	22.90	23.45
Guangdong	18.15	19.62	17.49	16.48	17.38	27.14	27.32
Guangxi	22.92	22.02	21.56	22.29	22.06	21.89	21.54
Hainan	22.45	20.90	21.04	21.20	20.91	25.20	24.76
Chongqing	13.95	18.76	17.74	17.28	18.25	18.47	18.52
Sichuan	19.62	21.21	20.26	31.39	21.10	20.69	20.54
Guizhou	21.75	21.23	21.13	21.94	20.93	26.24	25.13
Shanxi	21.55	20.84	20.43	19.33	18.97	19.19	19.96
Gansu	20.10	20.42	20.18	19.83	19.83	23.40	22.10
Ningxia	19.71	25.58	21.21	24.30	24.64	23.97	23.43
Xinjiang	23.40	19.92	19.77	19.70	19.72	21.31	20.61

Compared with the urban low-income group, the poverty incidence of the rural low-income group is higher, and the declining trend is more significant, while the whole of change in poverty of the urban low-income group is smaller, which is due to the positive and negative incidence of poverty among the urban low-income group in each province. However, the poverty incidence of the rural low-income group is not only in a declining

state, but also the poverty incidence of the low-income group in each province is basically on a declining trend, indicating that the urban low-income group cannot ignore from another perspective.

In accordance with the dualistic economic structure of China, how to find the specific reasons that lead urban and rural low-income groups into poverty and hinder their income growth is the key to achieving the income increase in urban and rural low-income groups.

**Table 3.** Incidence of poverty among rural low-income groups by province from 2013 to 2019.

Region	2013	2014	2015	2016	2017	2018	2019
Beijing	18.71	17.67	21.85	21.27	20.15	19.73	19.71
Hebei	33.96	31.87	29.84	28.99	28.61	31.56	33.06
Shanxi	35.71	33.76	32.14	31.93	30.77	28.81	27.77
Inner Mongolia	36.83	32.46	32.33	29.97	31.23	30.93	31.99
Jiangsu	29.02	28.13	28.01	26.65	26.23	27.92	17.97
Anhui	39.93	33.67	29.49	29.68	28.60	31.94	26.30
Fujian	30.24	27.49	26.03	26.87	25.59	26.20	23.83
Jiangxi	35.22	29.97	29.93	30.37	30.66	30.30	30.02
Henan	36.91	30.83	29.66	29.91	28.86	29.20	27.36
Hubei	38.96	27.86	29.15	29.52	30.20	29.91	27.11
Guangdong	28.10	28.04	25.47	26.06	25.68	23.57	20.12
Guangxi	35.54	34.08	31.05	32.04	31.29	29.79	27.78
Hainan	39.65	33.77	31.82	29.82	30.66	31.97	31.74
Chongqing	17.95	30.15	27.13	26.55	26.29	24.32	25.20
Sichuan	37.19	31.21	30.15	30.33	29.99	32.61	27.25
Guizhou	50.56	37.00	35.43	35.62	34.52	34.36	33.90
Shanxi	37.68	35.06	34.69	31.97	30.96	30.79	31.84
Gansu	51.23	43.02	38.25	38.08	38.19	35.61	33.16
Ningxia	41.06	31.72	30.94	30.93	30.36	32.14	29.09
Xinjiang	33.48	29.78	30.66	28.88	29.38	27.02	23.68

## 5. Quantifying and Decomposing the Income Increase in Low-Income Groups

The situation of low-income groups, in general, can be divided into two types: falling into poverty and achieving income growth, whose developing processes are opposite. The factors that reduce poverty also can achieve income growth and vice versa. Therefore, decomposing the poverty status of low-income groups so as to find the reasons that low-income groups fall into or exit poverty means to seek out the factors affecting the income increase in low-income groups and the degree of contribution of each element to income increase.

China's urban-rural "dualistic" structure places the urban and rural low-income groups into two different "worlds", and it is necessary to analyze the urban and rural low-income groups separately from the perspective of urban and rural areas, which is more conducive to the implementation of income-raising measures for low-income groups in urban and rural areas.

In China, there are significant differences between regions in terms of natural endowment, location, policy inclination, development history, and cultural background, resulting in distinct disparities in the status of low-income groups between regions. At the beginning of reform and opening-up, China has been implementing the economic reform policy of "letting some regions get rich first", and the eastern region has gained more capital, technology, and talents because of its advantageous coastal location. The eastern region has enjoyed most of China's "reform dividend" and has gradually become an economically developed region in China. At the same time, the low-income status of the eastern region is significantly better than that of the central and western, and the eastern regions of Zhejiang and Jiangsu during the period of poverty eradication not only completed total poverty eradication before the time set by the country but also used a poverty standard two to three times higher than the national poverty standard. At the national level, the economic

development of the central and western regions lagged significantly behind that of the eastern, leaving the central and western regions with more low-income groups. Although China has since implemented development strategies such as the Great Western Development, revitalization of the old industrial zone in the northeast, and promotion of the rise of the central region in an attempt to narrow the development gap between regions and gradually improve the poverty pattern, the disparity between regions has not been significantly ameliorated.

As a smaller unit of the region, provinces are the concrete manifestation of unbalanced and insufficient regional development, and the factors affecting the income increase in low-income groups vary greatly among provinces. For the western region, where low-income groups are concentrated, the factors that cause poverty are more complicated. Most of the low-income groups in western China are located in geographically disadvantaged or remote minority areas, which not only do not have the advantage in geographic location but also have limited ability to obtain development opportunities. As a result, the sustainability of low-income groups in western China is limited, and the phenomenon of poverty return occurs. In recent years, the low-income groups in the central region have been changing their poverty status by joining the wave of urban migrant workers. The rural low-income groups in the central western regions are mainly engaged in agriculture. However, the low-income groups in the central region have been able to escape from poverty and increase their income by enjoying the non-agricultural employment opportunities brought by the increasing urbanization, which is the most effective way for the low-income groups in the central region to escape from poverty. The low-income groups in the east are significantly better than those in the central and western regions in terms of both quantity and quality. If a uniform national standard for low-income groups is formulated, only an extremely small number of low-income people are residing in the eastern coastal region.

The study of the income increase in low-income groups and the influencing factors in combination with urban–rural, regional, and provincial characteristics will be more in line with the current situation of poverty in China, which can provide a basis for policy formulation in less economically developed regions and low-income groups, with the aim of further improving the poverty situation in less economically developed regions and increasing the income of low-income groups through the continuous improvement of existing policies. The changes in poverty of low-income groups are decomposed from urban–rural, regional and provincial perspectives, and the decomposition results are shown in Tables 4–7.

**Table 4.** Decomposition of poverty changes in low-income groups.

Poverty Index	Variation	Growth Effect	Distribution Effect	Heterogeneity Effect
H	−6.58	−2.45	7.23	−11.35
PG	−1.63	−1.19	3.89	−4.34
SPG	0.26	−0.73	3.12	−2.12

**Table 5.** The decomposition of factors for increasing the income of urban and rural low-income groups.

Poverty Index	Variation		Growth Effect		Distribution Effect		Heterogeneity Effect	
	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural
H	1.34	−7.92	1.87	−4.32	6.25	0.98	−6.78	−4.57
PG	1.09	−2.72	0.63	−1.82	3.01	0.88	−2.55	−1.79
SPG	0.81	−0.54	0.28	−1.01	1.75	1.37	−1.23	−0.90

**Table 6.** Deconstruction of income-increasing factors for low-income groups in the eastern, central and western regions.

Poverty Index	Region	Variation		Growth Effect		Distribution Effect		Heterogeneity Effect	
		Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural
H	Eastern	1.28	−5.50	0.72	−2.53	5.06	−0.91	−4.50	−2.07
	Central	1.98	−9.63	3.54	−6.05	8.64	0.20	−10.21	−3.78
	Western	0.76	−8.62	1.35	−4.40	5.04	3.65	−5.62	−7.87
PG	Eastern	0.17	−2.48	0.24	−1.13	1.60	−0.48	−1.67	−0.87
	Central	1.73	−2.04	1.25	−2.41	4.43	1.59	−3.95	−1.23
	Western	1.36	−3.64	0.40	−1.92	3.00	1.54	−2.04	−3.26
SPG	Eastern	−0.10	−1.42	0.10	−0.66	0.55	−0.24	−0.76	−0.52
	Central	1.28	1.11	0.59	−1.29	2.71	2.69	−2.02	−0.30
	Western	1.25	−1.32	0.15	−1.09	2.00	1.65	−0.90	−1.87

**Table 7.** Decomposition of factors for increasing income of provincial urban and rural low-income groups.

Poverty Index	Region	Variation		Growth Effect		Distribution Effect		Heterogeneity Effect	
		Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural
H	Beijing	−5.70	1.00	−7.08	2.79	−4.08	2.40	5.46	−4.19
	Hebei	3.82	−0.90	1.35	−2.53	6.39	2.13	−3.92	−0.49
	Shanxi	−1.82	−7.93	1.57	−3.27	1.26	0.41	−4.65	−5.07
	Inner Mongolia	−2.33	−4.85	1.57	−2.61	−1.17	−0.90	−2.72	−1.34
	Jiangsu	−2.64	−11.05	0.82	−5.47	2.38	−8.51	−5.84	2.93
	Anhui	−0.53	−13.63	1.32	−9.23	4.12	−2.24	−5.98	−2.16
	Fujian	6.03	−6.41	5.75	−2.73	12.50	−0.40	−12.22	−3.28
	Jiangxi	4.36	−5.19	1.20	−4.53	10.40	4.70	−7.23	−5.37
	Henan	2.77	−9.55	12.35	−6.85	17.50	−0.01	−27.07	−2.69
	Hubei	5.12	−11.84	1.28	−6.36	9.94	−1.85	−6.10	−3.63
	Guangdong	3.86	−7.74	−0.72	−2.54	5.18	−3.51	−0.60	−1.70
	Guangxi	−1.38	−7.76	0.70	−4.58	4.75	7.77	−6.83	−10.94
	Hainan	2.31	−7.92	4.20	−5.89	8.01	2.77	−9.90	−4.80
	Chongqing	4.57	7.25	4.27	11.58	9.70	13.68	−9.40	−18.00
	Sichuan	0.92	−9.94	1.35	−6.36	5.19	2.77	−5.63	−6.35
	Guizhou	3.38	−16.66	−0.77	−14.62	3.07	−1.73	1.09	−0.31
	Shanxi	−1.25	−5.83	1.18	−8.19	0.53	0.85	−2.96	1.50
	Gansu	2.00	−18.07	1.46	−12.97	6.63	0.59	−6.09	−5.70
	Ningxia	3.72	−11.96	1.55	−8.94	8.99	−0.08	−6.82	−2.94
	Xinjiang	−2.79	−9.79	0.81	7.11	7.63	9.86	−11.23	−26.77

The results suggest that poverty changes are counteracted by two distinct effects. First, there is an adverse effect of distribution on income increase. Second, the growth and heterogeneity effect strengthens the impact of income increase on low-income groups. On the whole, the incidence and depth of poverty among low-income groups dropped respectively by 6.58% and 1.63% from 2013 to 2019, but the intensity of poverty raised by 0.26%. This also means that the implementation of the national poverty eradication campaign has effectively improved the poverty situation of low-income groups. As shown by the decomposition results of the poverty index, economic growth has a distinct poverty reduction effect, income distribution inequality consistently worsens the poverty situation, and the worsening influence is significantly higher than the poverty reduction effect of economic growth. The poverty reduction effect of the heterogeneity effect is higher than the sum effect of economic growth and income distribution inequality, making the poverty change index show a decreasing trend.

In the future, income distribution is the most essential factor leading low-income groups to fall into poverty, and it is the biggest obstacle preventing low-income groups

from achieving income increases, which should be mainly focused on in the future. The country should pay attention to individual heterogeneity while improving the income distribution system, which is the main contributor for low-income groups to eradicate poverty and achieve income increases. Income distribution is the most vital factor leading low-income groups into poverty and the greatest obstacle preventing low-income groups from achieving income increases. While improving the income distribution system, we should pay attention to individual heterogeneity, the largest contributor for low-income groups to leave poverty and achieve income increases.

To further explore whether there are urban–rural differences in the factors affecting the income increase in low-income groups, an analysis about the poverty situation of low-income groups was conducted at the urban–rural level to implement scientific classification and plan for increasing the income paths of urban and rural low-income groups. As shown in Table 5, the poverty status of urban and rural low-income groups is remarkably different from the overall urban and rural levels. The incidence, depth, and intensity of poverty in urban low-income groups increased. However, the poverty situation of rural low-income groups was alleviated to some extent, which is the result of the continuous assistance to rural low-income groups by the national poverty eradication strategy implemented since 2013. This also shows that the state has not paid enough attention and has helped urban low-income groups to realize income increases while implementing the poverty eradication strategy in rural areas, thus making urban low-income groups deepen in poverty. Although the poverty situation of rural low-income groups is better, it is generally true that rural low-income groups face a more severe poverty situation than urban low-income groups. This reflects that after 2020, rural low-income groups should be the primary group, complemented by urban low-income groups, working in tandem to help urban and rural low-income groups escape from poverty and collaboratively promoting income growth of low-income groups.

The decomposition results of poverty changes reveal that economic growth worsens the poverty of urban low-income groups, while it improves the poverty of rural low-income groups. Although urban economic growth is faster than rural areas, urban low-income groups gain lower development results from economic growth than the general level, which continues to widen the income gap between urban low-income and middle- and high-income groups, leading to falling into more severe poverty. Inequality in income distribution exhibits a worsening effect on both urban and rural low-income groups, which is consistent with the findings of other recent scholars. The low-income groups themselves are at the bottom of the income distribution and have less access to the fruits of economic development, which further aggravates the poverty of the low-income groups by enlarging the gap between the rich and the poor. The heterogeneity effect has a notable poverty alleviation effect on urban and rural low-income groups, reducing the incidence of poverty by 6.78% and 4.57% for urban and rural low-income groups, respectively, and has a significant effect on poverty reduction in urban areas. Where the worsening influence of economic growth and income distribution on poverty is higher than the poverty reduction effect of the heterogeneity effect, the poverty situation of urban low-income groups deteriorates continually. In rural areas, the exacerbating impact of income distribution on poverty is weaker than the poverty-reducing effect of economic growth and heterogeneity, resulting in a continuous improvement of poverty among rural low-income groups. Individual heterogeneity is the most crucial factor in reducing poverty and achieving income growth.

Due to the characteristics of low-income groups in China being regional, the poverty status of urban and rural low-income groups is decomposing from the regional level. Apart from a slight alleviation in poverty intensity in the eastern region, the poverty incidence and poverty depth of urban low-income groups and the poverty intensity in China's central and western regions show a deepening trend. Different from urban areas, the incidence of poverty among rural low-income groups decreased by an average of 7.83%, with a decline in the poverty incidence, depth, and intensity of China's central and western regions.



From the decomposition results, the poverty reduction effects of economic growth exist in urban–rural areas and between regions. The economic growth leads to a remarkably higher incidence of poverty in urban low-income groups in the central and western regions but makes the poverty situation of rural low-income groups in the central and west significantly alleviated. In contrast, the influence of economic growth on poverty in the eastern low-income groups is lower. The distribution effect is more complicated than the growth effect, with the distribution effect manifesting itself as worsening poverty among urban low-income groups and rural low-income groups in the central and west of China and as alleviating poverty among rural low-income groups in the east, with inequality in income distribution worsening poverty to a greater extent among urban low-income groups in central and rural low-income groups in the west of China. Heterogeneity is a clear poverty-reducing effect for urban and rural low-income groups, and it is more prominent in the central and western than in the eastern regions. Combining the decomposition results of the east, central, and west, it is clear that the income increase in regional low-income groups should be integrated with regional or district characteristics and should focus on regional heterogeneity with the established economic development level and income distribution status. It is a highlight of the work to make full use of the poverty alleviation effect of regional heterogeneity to achieve income increases in low-income groups in the future.

The above results appear to be convincing in suggesting that it is crucial to realize the classification management of low-income groups and analyze the poverty changes of low-income groups in each province. The income-enhancing factors of low-income groups in the provinces in Table 7 can be divided into four types. The first category is that low-income groups fall into poverty, in which economic growth and income distribution hinder low-income groups from increasing income. Independent heterogeneity is capable of improving the income status of low-income groups, in which the promotion effect of individual heterogeneity on low-income groups' income increase is lower than the inhibiting effect of economic growth and income distribution on income increases such that low-income groups as a whole appear to slip into poverty. As the towns in Hebei, Fujian, Jiangxi, Henan, Hubei, Hainan, Chongqing, Sichuan, Ningxia, and Gansu and the rural areas in Beijing belong to this development type, the trickle-down effect of economic development and income distribution on low-income groups should be emphasized in such areas and further strengthen individual heterogeneity. When the degree of influence of individual heterogeneity on the income increase in low-income groups is higher than the inhibiting effect of economic growth and income distribution on the income increase in low-income groups, the low-income groups in such areas can realize income increases.

The second category is that economic growth and income distribution have an inhibitory effect on income increases in the low-income group under the circumstances that the low-income group achieves income increases, and individual heterogeneity promotes income increases in the low-income group, in which the inhibitory effect is smaller than the promotion effect. Such a category includes urban areas in Shanxi, Jiangsu, Anhui, Guangxi, Shanxi, Xinjiang, and rural areas in Chongqing and Xinjiang. For facilitating the income increase in low-income groups in these areas, attention should be paid to the contribution of the individual heterogeneity to the income increase in low-income groups and adjusting the economic development and income distribution policies to favor low-income groups.

The third category is that both economic growth and individual heterogeneity have the effect of driving income increases while the income distribution hampers the income increase in low-income groups in the context of low-income groups realizing income increase. This category mainly consists of rural areas in Hebei, Shanxi, Jiangxi, Guangxi, Hainan, Sichuan, Shanxi, and Gansu. We should concentrate on income distribution, gradually improve the income distribution pattern under the existing development situation, and accelerate the process of income increase in low-income groups.

The fourth category involves economic growth, income distribution, and individual heterogeneity, all having the raising-income effect, which is made up of rural areas in Inner Mongolia, Anhui, Fujian, Henan, Hubei, Guangdong, Guizhou, and Ningxia. The

feasible way to enhance the income of low-income groups in this category is to continuously encourage the low-income groups to realize income increases based on the existing policy guidelines, and give priority attention to those with more distinct effects in promoting income increases among the three to accelerate the process of income increases.

Through the above analysis, it can be concluded that when the other two factors remain constant, economic growth is conducive to poverty reduction, aggravation of income distribution deepens poverty, and individual heterogeneity contributes to poverty alleviation. Economic growth, income distribution, and individual heterogeneity have obvious urban–rural, regional and district heterogeneity. When the three factors act together on poverty, it is necessary to compare the magnitudes of the positive and negative effects to accurately grasp the low-income group's poverty status. Thus, Hypotheses 1–4 are verified.

Since the current measurement of poverty among low-income groups primarily focuses on poverty incidence, and the analysis results of poverty depth and intensity for low-income groups are consistent with those of poverty incidence, it will not repeat.

## 6. Conclusions and Recommendations

Based on the Gini coefficients, this article adopts a weak relative criterion to dynamically measure the poverty index of low-income groups in each province and decomposes it to analyze the impact of economic growth, income distribution, and individual heterogeneity on the income increase in low-income groups. This paper measures low-income groups from the perspective of provinces under the goal of common prosperity, which is indispensable both in consolidating the results of poverty eradication and promoting the income increase in low-income groups to accelerate the achievement of common prosperity, which is also rarely seen in previous studies. Therefore, the measurement of low-income groups can lay the foundation for local governments to develop new support measures. Combining regional heterogeneity to analyze income-generating factors of low-income groups in detail at the national level as a whole, urban and rural levels, the regional level, and district level can help to adopt long-term income-generating policies that are more appropriate to the actual development of the district from the practical level. The national measures to help low-income groups are implemented from the overall aspect, while China is a large and multi-ethnic country; thus, the income increasing measures for low-income groups from the provincial level are more targeted and meet the most practical needs of regional development. This paper analyzes the factors of income increases for low-income groups from this perspective, realizing the disaggregated policy of income increases for low-income groups through the classification of income-increasing paths in provinces to promote the income increase in low-income groups and to contribute to the early realization of rural revitalization and common prosperity.

The empirical analysis draws the following main conclusions.

First, while the overall scale of the low-income groups decreases, the scale of urban low-income groups expands, but its trend is smaller than the former. In the future, there should be more attention paid to the issues of increasing the income of urban low-income groups. Its increasing trend in the east, middle, and west is basically consistent, and the development pattern of income increases in rural low-income groups in the east is obviously “better” than that in the middle and west. The income growth of urban and rural low-income groups can be divided into four categories, of which three have achieved income growth, but one has fallen into poverty.

Second, inequality has sizeable negative impacts on increasing income for low-income groups. Individual heterogeneity is a vital factor in promoting income increases for low-income groups. Improving the education level of low-income groups, health status, and other heterogeneous factors are essential efforts to boost income increases for low-income groups. There are differences between urban and rural low-income groups in terms of income-raising factors: for the urban low-income groups, more concerns should be given to economic growth and income distribution, while for the rural low-income groups, raising

income is mainly accomplished through economic growing, human capital improvement, and improved household size.

Third, it was found that economic growth and income distribution have a suppressing effect on the income increase in urban low-income groups, which is more significant in central and western China. However, individual heterogeneity has a facilitating effect on the income increase in urban low-income groups, especially in the central and western regions. Economic growth has a catalytic impact on the income increase in rural low-income groups, while income distribution only has a facilitating effect on the income increase in rural low-income groups in the east and a negative effect on the central and western rural areas. To promote the income increase in low-income groups with regional characteristics, the decomposition of the factors of income increase in urban and rural low-income groups from the provincial perspective reveals that various regions have different paths to increase the income of urban and rural low-income groups, and the feasible measures are classification management combined with regional advantages in the future.

Based on these findings, the following recommendations are made. We can now combine the main results from the above to make recommendations, which are interpreted as follows.

The first is increasing the inclusiveness of economic growth and optimizing the income distribution system. The inclusive growth of the economy enables low-income groups to obtain above-average development results from economic development, thereby further narrowing the income gap between low-income groups and other groups. The optimization of income distribution structure is the most crucial factor to promote income increases for low-income groups. The sustained optimization of income distribution structure focuses on improving the factor distribution system, actively playing the government's role in regulating income distribution such as taxation, social security, and transfer payments, and emphasizing the influence of the third distribution on the overall income distribution system. Actively promoting the integrated development of urban and rural areas, developing regional coordination, and giving attention to regional equity. Breaking monopolies, eliminating urban–rural barriers, optimizing the spatial layout of industries, and deepening east–west cooperation and counterpart support.

Second, the human capital cultivation of low-income groups is regarded as the key to improving the ability of low-income groups to increase their income and become rich. Based on the reality that the education level of low-income groups is low, it is better to provide vocational skill training for low-income groups to meet their development needs by improving their employability, creating employment opportunities, and enriching employment methods. The low-income groups are exposed to greater health vulnerability and the risk of “poverty due to illness and return to poverty due to illness,” therefore, while improving the level of cooperative medical care and medical assistance for the low income groups, we should also actively advocate for disease prevention and health care for them.

Lastly, we should accelerate the promotion of a unified social security system covering all people, urban and rural areas. An effective social security system can reduce the burden of family support for low-income groups and increase the hidden income of low-income groups. Meanwhile, it is also a solid backing for rural low-income groups to realize their working methods such as outworking, participating in non-farm employment, and self-employment. Under the background of the aging population, a social security system that effectively covers all the people in urban and rural areas is an important guarantee to realize the income increase in low-income groups.

Through the above analysis, this article still has the following limitations. Due to data limitations, 20 provinces in mainland China were selected for the study, and other provinces were not taken into account, which may lead to a less accurate grasp of China's low-income groups and their income increases. In the future, we hope to use the income data in the microdatabase and group them to simulate the income group data of urban and rural residents to make up for the lack of macro-income grouping data. In terms of

decomposition, the changes in the poverty line can be subsequently carried out as well, so as to more comprehensively and accurately measure China's low-income groups and their income increases.

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