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Article

A Comparative Analysis of Vulnerability to Poverty between Urban and Rural Households in China

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Abstract: This study proposes a subjective poverty line for each household to quantify the vulnerability to poverty in urban and rural households by considering residents' expectations and their propensity to compare their perceived welfare level with those of other community members. The findings show that the overall vulnerability incidence in urban households is lower than in rural households. The regional differential in terms of vulnerability to poverty continues to exist, but the western province in both urban and rural households has not shown a significantly higher vulnerability rate than in other regions. Educational qualification is a determinant of the vulnerability of rural residents, whereas it does not have remarkable positive effects on urban households. Meanwhile, the impacts of welfare systems upon both urban and rural households are larger than expected, while the coverage of them is incomplete and calls for government to implement more social reforms in order to mitigate the risk and buffer the vulnerability, and to adopt a more equalising approach (instead of unrestrained growth).

Keywords: subjective poverty line; vulnerability to poverty; China; regional differential

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1. Introduction

During the economic reform that started in 1978, China experienced rapid economic growth and underwent a remarkable transformation. During the process, the disparity (in terms of household poverty) between urban and rural areas and among provinces increased significantly, attracting considerable attention (Park and Wang 2001; Li et al. 2013; Zhang et al. 2014; Qi and Wu 2016; Sun et al. 2020). The Chinese government has taken measures with which to curtail household poverty. However, as the traditional poverty line mainly measures absolute poverty and assesses the current poverty status, it does not consider the future poverty status. In other words, the existing absolute poverty line[1] considers only the static status of household poverty while ignoring that poverty is a multifaceted and dynamic phenomenon. Under this circumstance, the vulnerability assessment estimates the ex ante probability of households becoming poor in the future.

Furthermore, unlike previous research that established a standardised poverty line for households, this analysis proposes a subjective poverty line for each household to quantify the vulnerability to poverty in urban and rural households by considering residents' expectations and their propensity to compare their perceived welfare level with that of other community members. Moreover, this study will explore how potential factors affect vulnerability to poverty and how these factors foster social and economic disparities between urban and rural households. Meanwhile, it is worth evaluating how geographical differences exist in the vulnerability to poverty of urban and rural households in regions with distinct economic growth statuses (Peng et al. 2010; Rizov and Zhang 2013). Specifically, the economic reform and the open-door policy[2] in 1978 not only brought about spectacular economic growth in coastal regions, but also widened the regional disparities between coastal regions and inland regions, especially for western areas with few highways and navigable rivers.

The findings also evaluate the effects of several social welfare systems launched by the Chinese government since 2003 upon poverty reduction and assess whether the gap between urban and rural households in terms of vulnerability to poverty has decreased. Specifically, the Chinese government implemented the New Medical Insurance Scheme so as to reduce the financial burden on poor patients by gradually covering extended medical treatment and establishing a rural pension scheme to double the pension coverage in rural regions (Zhang et al. 2006; Atella et al. 2013; Korir et al. 2021).

The paper is structured as follows. The literature review looks at recent research on vulnerability to poverty and examines various forms of poverty lines to assess household deprivation. Subsequently, the sample is described. The methodology section explains how the subjective poverty line can be used to measure the impacts of various factors upon the vulnerability level of households in urban and rural areas, respectively. The results section provides the final results regarding how the vulnerability level varies regionally and across urban and rural households to draw a picture of how possible factors affect households being poor and to conduct a multidimensional assessment of the vulnerability in urban and rural households, respectively.

2. Literature Review

Many studies have discussed the issue of households' vulnerability and some of them have described this as the probability of becoming poor in the near future (Pritchett et al. 2000; Kurosaki 2002; Chaudhuri et al. 2002; Heitzmann et al. 2002; Chaudhuri 2003; Christiaensen and Subbarao 2005). Chaudhuri et al. (2002) claim that vulnerability is concerned with the ex ante probability of a non-poor household falling below the poverty line or a poor household remaining in poverty. Heitzmann et al. (2002) partially agree with the argument and further point out that vulnerability could be regarded as the probability of welfare loss relative to a predetermined benchmark. Chaudhuri (2003) arrives at the same conclusion and goes further to explain that vulnerability can be considered the probability of incurring a significant welfare shock, which results in a household being unable to reach a predefined benchmark. Accordingly, Christiaensen and Subbarao (2005) define vulnerability as the probability of becoming poor in the future.

Meanwhile, some studies have highlighted the relationship between risk and vulnerability. Pritchett et al. (2000) regard vulnerability as the risk of a household experiencing poverty at least once in the near future. Kurosaki (2002) presents a similar argument and explains vulnerability to consumption risk as the situation in which consumption has to be drastically reduced after experiencing negative shocks. Similar to Kurosaki (2002), several studies have linked vulnerability with consumption. According to Christiaensen and Boisvert (2000), food consumption is related to vulnerability and the probability of being undernourished in the future. Thus, it should be considered in the measurement of vulnerability in households. Furthermore, Kamanou and Morduch (2002) raise a concern surrounding vulnerability not only to food consumption, but also to the consumption of necessities in daily life. According to the authors, "households or groups are judged to be more vulnerable if standard deviations of past consumption changes are higher".

Günther and Harttgen (2009) disagree with Kamanou and Morduch (2002) concerning vulnerability; rather, they regard vulnerability as the probability of suffering negative income shocks. A similar argument also appears in the study conducted by Glade (2003), wherein vulnerability is defined as a stochastic poverty prediction, which is based on past analysis of income and shocks. Both Cunningham and Maloney (2000) and Albert et al. (2007) point out that vulnerability is a question of both changes in economic status and the initial position in income distribution.

Vulnerability has been conceptualised in various ways in the aforementioned studies. However, all of the definitions share a common feature: vulnerability implies a relation among poverty, risk, and risk management.

With regard to the poverty threshold, absolute poverty and relative poverty lines are widely discussed (Townsend 1985; Chen and Ravallion 1996; Khan and Riskin 2001;

Park and Wang 2001; Sen 2008; Green and Hulme 2005). Khan and Riskin (2001) define an absolute poverty line based on a minimum appropriate caloric requirement of between 2000 and 2500 calories per person per day and non-food consumption per person per day. The absolute poverty line considers a minimum living standard. However, several scholars have criticised its feasibility when measuring the living standard in countries with different institutions (Callan and Nolan 1991; Park and Wang 2001; Sen 2008). Sen (2008) argues that the measurement of absolute poverty neglects "welfarism" and explains the term as encompassing any interpersonal comparisons of utilities. Park and Wang (2001) raise a concern surrounding the errors associated with the sources of measurement in the calculation of an absolute poverty line and show that the inter-provincial differences in food prices increase the difficulty of obtaining a united standard.

In Mainland China, there is no mandated and united urban absolute poverty line for households in different regions. Instead, the living standard guarantee programme is considered to be the urban absolute poverty line (Wu et al. 2010; Zhang et al. 2014). The urban minimum living standard guarantee programme in China is called *dibao.* It is aimed at providing very low-income households with a transfer payment, which would enable them to maintain their basic livelihood. The payment is equal to the difference between the average income per person in a household and the defined minimum income threshold. This threshold needs to be equivalent to the cost of clothing, food, and other basic necessities. This programme is administered at the municipal level and the payment amount varies among regions and considerably reflects the financing capacity of the local government[3]. In addition, the price differences between the 31 mainland first-level administrative areas (including provinces, provincial-level municipalities, and autonomous regions—all such entities are referred to as "provinces" hereafter) imply that the urban minimum income threshold is different across provinces. It is based on the province-specific consumer price indexes. However, Li et al. (2013) argue that the gap between thresholds in certain provinces is larger than the expected result based on the GDP. Specifically, the urban minimum income poverty line in Shanghai is one third higher than in urban Henan, and nearly two thirds higher than in urban Jilin. In addition, the ability of the minimum income thresholds to reflect the actual economic status has been questioned. Bhattamishra (2008) stresses that the average threshold in China is much higher than the poverty line defined by the World Bank. Moreover, the *dibao* system excludes certain residents who are eligible for entitlement.

In a number of Western countries, compared to the absolute poverty line, the relative poverty line is mainly used to measure the degree of poverty. Instead of being based on a fixed minimum living standard, it considers the standards of living to which the majority are subject. Specifically, contrast to the absolute poverty line, this measurement is more concerned with whether a household is stressed when excluded from the standard of living of the majority of households in society. Both Sen (2008) and Townsend (1985) point out that this measurement is highly correlated with the welfare measure's development within the sample. If the income distribution widens, then the poverty headcount rate at the relative poverty line will increase.

The relative poverty line is also used to measure the degree of poverty in China (Wong 1995, 1997; Saunders 2007; Osberg and Xu 2008; Qi and Wu 2016; Dasgupta and Badola 2020). Compared to provinces in Western countries with similar economic development, the heterogeneous economic development of different provinces in China tends to be measured at the regionally differentiated poverty line. Wong (1995, 1997), based on local economic development and the local standard of living, suggested a relative poverty line at 50% of the median income in Guangzhou and Shanghai. It was further illustrated that the regional difference in terms of income inequality widened from 1995 to 1997. Saunders (2007) adopts a similar approach to the one proposed by Wong (1995, 1997). The study focuses on elderly residents in urban China and points out that the relative poverty rates among the elderly in urban China are as high as the relative poverty rates among the elderly in developed countries such as the United Kingdom and the United States. Furthermore, Osberg and

Xu (2008) define the relative poverty line at 50% of the median income in urban and rural China, respectively. It was found that in terms of the poverty rate there was a considerable difference between urban and rural areas. A similar approach was adopted by Qi and Wu (2016), wherein the focus was mainly on investigating the relationship between the relative poverty rate and the number of children in urban China. The study found that the relative poverty rates for households owning local city *hukou* with more than one child had increased in comparison to those households with the same conditions in the past decade. It is worth noting that some of the aforementioned papers set a relative poverty line based only on per adult consumption and neglect the effects of children upon household consumption, while some of them merely consider the number of children in a household and ignore the difference between children and adults in terms of consumption. Thus, their consideration of the possible influencing factors is not comprehensive. Moreover, instead of reflecting on an individual's actual economic status, the aforementioned studies focus only on measuring the proportion of the population obtaining an income lower than a fixed percentage of the median income.

In addition to the two mainstream measurements of poverty mentioned above, Goedhart et al. (1977), Gustafsson et al. (2004) and Gustafsson and Yue (2006) consider household income and expenditure and create a subjective poverty line based on a respondent's minimum cash requirement. They apply it in order to measure the degree of poverty in urban and rural households, respectively. The equivalence scale is an important component in estimating the subjective poverty line. It changes from one country to another. Förster (1994) points out that if the household size is used as the determinant, equivalence scales could be shown through "equivalence elasticity"[4]. Atkinson et al. (1995) apply the same method to the measurement of household poverty and further explain that equivalence elasticity can range from 0, when unadjusted household disposable income is obtained as the income measure, to 1, when per capita household income is used. In other words, the smaller this equivalence elasticity is, the higher the economies of scale that appear in consumption. Several equivalence scales are used for estimating the subjective poverty line in countries with different institutions. Even in the OECD, it is difficult to find an equivalence scale that can be recommended for general use.

Several studies have provided different equivalence scales in China. The analysis groups are different and intra-differentiation exists across different regions. Huang (2013) assigns the value of 1 to the first member of the household in Hong Kong. The value of 0.33 is applied to other adults in the household, and the value of 0.47 is applied to each child in the family. Although this equivalence scale has been widely criticised, it is difficult to deny that the expenditure on education and healthcare for children in Hong Kong is higher than in the majority of cities in East Asia. In contrast to the criticism of the equivalence scale in Hong Kong, there are few debates surrounding the equivalence scales in Mainland China.

If we consider the number of children in a household, it is difficult to ignore the effects of the one-child policy, which was implemented in the 1980s, on Mainland China's households. The policy mandated that each family could have only one child, which reduced China's fertility rate dramatically. However, in contrast to urban areas with more severe punishment regarding multiple-birth households, rural areas showed laxity in enforcing punishment on those households. Consequently, the average number of children in rural areas is greater than that in urban areas (Zhang 2008). It is worth noting that previous studies have not considered the effects of children upon the level of poverty and that the value is set only for adults in households. The expenditure on smaller children in a family is higher than expected, especially for children aged below seven in Mainland China. Expenditure on smaller children comes mainly from two aspects. The first aspect is food consumption, with parents more likely to feed babies with imported food, such as milk, instead of rice and grain (as is customary with adults). Previous surveys indicate that young parents insist that imported children's food has more nutrition and is helpful for children to grow up. However, the average bottle of imported milk costs $40, which is more expensive than other food in China and increases food consumption in households

significantly (Sabates et al. 2001; Gould and Villarreal 2006; Liu et al. 2018; Zakari et al. 2014). Simultaneously, the coverage of public kindergarten in the Chinese community is limited and unable to satisfy the needs of the majority of households with small children, forcing parents with a strong desire towards "providing their children with a head start" to turn to private kindergarten with expensive educational expenditure (Pan et al. 2020; Wang and He 2020; Maleki et al. 2018; Wang and Wu 2021). Moreover, households with small children are unable to gain more financial support from local municipal authorities. In addition, compared to children between the ages of seven and 16, children below the age of seven require more care from the family, which causes parents to struggle to manage the family budget, and they may be more likely to enter poverty. The percentage of child expenditure in a household in China is higher than that in other Asian countries and it is worth taking the number of children aged between zero and seven into account in this study (Zhang 2008; Huang 2013). Meanwhile, this study divided children into two groups, namely children aged between zero and seven and children aged between seven and 16, as China implemented a nine-year compulsory education policy in 1986 and enables all children to have free education in both primary school (grades 1–6) and junior secondary school (grades 7–9). In general, a child starts primary school in year 7 and finishes secondary school in year 16 (Liu and Qi 2005; Yang 2018). During this period, teachers in different types of schools assume the responsibility of caregivers, and literally decrease household expenditure in this respect. Furthermore, it is worth observing whether free education could decrease the financial burden on families and whether the number of children (below year 7) and number of youths (years 7–16) show varied impacts on household poverty to vulnerability.

Moreover, considering that the consumptions of children aged between zero and seven and children aged between seven and 16 are varied, this study assigns them different values when measuring the household income scale, which is different from in past papers and ensures that the adjusted per adult household income equivalent and per adult household minimum cash requirement equivalent could reflect the actual economic situation for each household.

3. Data Description

In general, panel data is more suited to estimating household vulnerability to poverty than is any other type of data, since it provides essential information on the same households for a period of time. However, detailed panel data, such as the minimal monetary demand of a household, is difficult to find in China. In these scenarios, cross-sectional data will be employed in this study to evaluate vulnerability to poverty.

The cross-sectional data comes from the Chinese household income project 2013-urban (CHIPU) and the Chinese household income project 2013-rural (CHIPR), which contain respondents' personal information such as age; educational qualifications; health conditions; marital status; employment situation; and whether the pension, work injury, and housing fund are available, respectively. In addition to basic personal information, the Chinese household income project collects financial information on each respondent's family, such as household income, total value of durables, and financial assets, which can be used to assess the relationship between family characteristics and their vulnerability to poverty. Furthermore, this dataset depicts the minimal cash necessary to support the entire family, which may be used to compute each household's subjective poverty line.

Tables 1 and 2 show the factors that were used in this study individually. To accurately measure a household's income scale, the head of the household and other adult family members are assigned values of 1 and 0.7, respectively, while those below the age of 18 but above seven and those below the age of seven are assigned values of 0.47 and 0.30, respectively. A household's income and minimum cash requirement are then divided by the household's total equivalent, and the household's income per adult equivalent and the household's cash requirement per adult equivalent can be calculated independently (Huang 2013; Angelillo 2014; Gao et al. 2020; Tran et al. 2021).

In addition, we examine *hukou*, a unique method of household registration utilised in Mainland China. There are several types of *hukou* in urban and rural China, including local city *hukou*, non-local city *hukou*, local city rural *hukou*, and non-local rural *hukou*. Of these, only local city *hukou* will significantly impact urban and rural residents' income and welfare programmes, as this type of *hukou* entitles holders to purchase a house and car in a local city and provides them with a generous medical aid, housing fund, and pension, as well as enabling their children to access local public elementary and secondary school. Thus, we control local city *hukou* as an independent variable to measure a household's vulnerability to poverty in both urban and rural families.

The following two marital status categories are evaluated as being married, according to the head of a household's marital status: married and remarried. As married persons are more likely to share the burden of caring for the elderly and children, it will allow them to relieve mutual job and familial pressures at the same time. Previous research has suggested that, compared to a single person, a marital status of married may boost a household's income and reduce the risk of becoming poor, which is worth discussing in this study (Stone and Short 1990; McDowell 2005; Sarker et al. 2019).

It is necessary to mention that this study uses an aggregate index for well-being, rather than individual variables, since the endowment of different social securities by households is strongly connected and inserting them into the model separately might result in no significant impact. As a result, the welfare index is calculated utilising the five social security variables of medical insurance, housing fund, work injury, pension, and unemployment insurance[5].

Table 1. Descriptive statistics for urban households.

Description of the Variables	Mean	SD	Min	Max
ln (household income per adult equivalent)	10.28	0.63	6.70	13.66
ln (household minimum cash requirement per adult equivalent)	9.64	0.62	6.34	12.25
Adult equivalent	2.25	0.68	1	5.5
Head of household: female	0.27	0.45	0	1
Age of head of household	50.22	13.18	17	97
Married	0.89	0.32	0	1
Household belongs to ethnic minority	0.05	0.21	0	1
Number of the elderly	0.52	0.80	0	4
Number of youths (aged 7–18)	0.25	0.47	0	4
Number of children	0.19	0.42	0	2
Belong to the CPC[6]	0.27	0.45	0	1
Bad health	0.06	0.24	0	1
With local hukou	0.84	0.36	0	1
Coastal regions	0.17	0.38	0	1
With Long-term contract	0.37	0.48	0	1
Illiteracy	0.21	0.41	0	1
Demolition[7]	0.12	0.33	0	1
Employed	0.66	0.48	0	1
Demolition with no compensation	0.23	0.43	0	1
Satisfy with living standard	0.83	0.37	0	1
Satisfy with economic situation	0.21	0.41	0	1
ln (financial assets)	10.47	1.40	4.61	15.20
welfare	0.35	0.17	0	1.25

Source: Own elaboration from Chinese urban household income project 2013. Number of observations = 6674 household.

Table 2. Descriptive statistics for rural households.

Description of the Variables	Mean	SD	Min	Max
ln (household income per adult equivalent)	9.38	0.97	6.01	13.41
ln (household minimum cash requirement per adult equivalent)	8.81	0.66	5.57	11.80
Adult equivalent	2.91	1.01	1	9.4
Head of household: female	0.09	0.28	0	1
Age of head of household	51.84	11.52	18	97
Married	0.71	0.29	0	1
Household belongs to ethnic minority	0.07	0.26	0	1
Number of the elderly	0.57	0.80	0	4
Number of children	0.30	0.57	0	5
Number of youths	0.35	0.60	0	5
Belong to CPC[8]	0.11	0.31	0	1
Bad health	0.10	0.29	0	1
With local hukou	0.02	0.15	0	1
Coastal regions	0.16	0.37	0	1
With Long-term contract	0.05	0.21	0	1
Illiteracy	0.17	0.37	0	1
Demolition	0.04	0.21	0	1
Employed	0.78	0.41	0	1
Demolition with no compensation	0.13	0.19	0	1
Satisfy with living standard	0.80	0.40	0	1
Satisfy with economic situation	0.17	0.38	0	1
In (financial assets)	9.67	1.48	2.30	15.10
welfare	0.04	0.12	0	1.33
Size of land (acres)	5.57	8.84	0	225.50

Source: Own elaboration from Chinese rural household income project 2013. Number of observations = 10,489 household.

4. Methodology

As highlighted in the literature review, the subjective poverty line is more appropriate for estimating vulnerability to poverty in developing countries, particularly China, than is the absolute poverty line. The CHIPU and the CHIPR provide information on actual income and the minimum cash requirement in urban and rural households, respectively.

Instead of focusing on family expenditure, we try to develop a subjective poverty line based on real household income and the minimum cash requirement. Thus, by following the method suggested by Gustafsson and Yue (2006), we divide each household's minimum cash requirement and actual household income by the number of adult equivalents and obtain the minimum cash requirement and actual income per adult equivalent separately. The dependent variable is the minimum cash requirement per adult equivalent, while the independent variables are the actual income per adult equivalent and other affected factors[9]. By means of the OLS regression, a subjective poverty line in each household can be obtained.

As Verbeek (2008) suggests, wealthier families may exhibit greater volatility of consumption than may poorer families, which means that the homoscedasticity assumption of the Gauss–Markov theorem of all the error terms with the same variance will be violated and may lead to the problem of heteroscedasticity. Under this circumstance, this study applies FGLS estimators, enabling us to correct the problem of heteroscedasticity of error terms in the regression model of household income and undertake an efficient estimation (Chaudhuri 2000; Chaudhuri et al. 2002; Verbeek 2008).

Firstly, household income is generated as follows:

$$lnI = X_s\theta + e_s \quad (1)$$

where I represents household income per adult equivalent; X_s is a set of recorded household characteristics including the number of family members in the household, the age of the head of the household, and the head of the household's educational status; θ represents a vector of parameters; and e_s is a mean-zero disturbance term.

It should be mentioned that because this study relies on cross-sectional data from a single year, instead of panel data, it cannot identify parameters that drive the persistence in the income level of each household, which raises the problem of heteroscedasticity. Thus, the variance of ${\sigma^2}_{e,s}$ of e_s could be written as Equation (2):

$$\sigma^2_{e,s} = X_s\beta \tag{2}$$

Thereafter, we use a three-step feasible generalised least squares method to obtain consistent estimators of θ and β, and applying the consistent and asymptotically efficient estimators of $\hat{\theta}$ and $\hat{\beta}$ to estimate the expected log income for each household, Equation (3) is formulated as follows:

$$\hat{E}\left[\ln \hat{I}_s \mid X_s\right] = X_s\hat{\theta}_{FGLS} \tag{3}$$

The variance of the log income for each household is shown as follows:

$$\hat{V}\left[\ln \hat{I}_s \mid X_s\right] = \hat{\sigma}^2_{e,s} = X_s\hat{\beta}_{FGLS} \tag{4}$$

Once these estimates are obtained, it is possible to estimate the probability of households with characteristics X_s being poor in the future. In other words, we can estimate a household's vulnerability level as follows:

$$\hat{v}_s = Pr(lnI_s < lnz|X_s) = \Phi\left(\frac{lnz - X_s\hat{\theta}}{\sqrt{X_s\hat{\beta}}}\right) \tag{5}$$

From Equation (5), the probability of each household facing poverty can be observed. Accordingly, it is necessary to distinguish those who are vulnerable and those who are not by setting different vulnerability thresholds. The more general approach is to set thresholds at 0.29 and 0.50[10].

Following Chaudhuri et al. (2002) and Imai and Azam (2012), the probability of a household entering poverty V^* can be calculated using the equation below:

$$V^* = 1 - \sqrt[n]{1 - V_n} \tag{6}$$

where V_n is the set vulnerability threshold and n is the number of following years. For example, if we apply the vulnerability threshold of 0.5 and calculate the vulnerability rate for a household in the following year, which means that n = 1, then V^* will be 0.29. This means that in the following year, the probability of a household falling into poverty once is 0.29.

5. Empirical Analysis

The stepwise regression and vif test methods were applied in this study, and all the independent variables had a vif smaller than 2 and a p value smaller than 0.1, which means that the variables were proper and meaningful in this study.

As suggested by Jann (2008) and Devkota et al. (2021), this study applied the Blinder-Oaxaca decomposition technique to analyse the differences between rural and urban households regarding the vulnerability rate. The differences in the various groups with variable characteristics can be found in Tables A5 and A6.

Overall, the unadjusted difference in the vulnerability rate between rural and urban households was 0.084, which was a basis for analysing a further decomposition. The explained component accounted for the nearly 80% outcome differential between rural and urban vulnerable households. From the explained component, all the variables with

different chrematistics contributed to the widening of the gap between rural and urban vulnerable households, while welfare and demographic characteristics brought about the most differences, explaining 52.3% and 40% of the vulnerability gap, respectively.

Previous studies found that there is a significant divide between rural and urban households in the Chinese welfare state, with urban households being more likely to obtain more generous and comprehensive welfare, and rural ones always receiving the minimal amount of welfare, which is fairly similar to the situation in less-developed countries (Gao 2010; Shi 2012). The findings in this study indicate that an improvement in the welfare system could have a significant impact in terms of narrowing the vulnerability gap between urban and rural households. These results, combined with the findings of previous studies, suggest that the current vulnerability gap between rural and urban households is still large, especially in the provision, generosity and progressivity of social benefits, which in turn indicates that a more balanced welfare system—contributing to the diminution and eventual elimination of the divide between rural and urban households—is required.

5.1. Discussions about the Source of Vulnerability in Urban and Rural Households

Table 3 illustrates the impact of a set of variables upon the vulnerability level in urban and rural households. Female heads of households show a lower probability of becoming vulnerable than do their male counterparts in both urban and rural households. Several previous studies arrived at a similar conclusion and explained that a certain number of urban female-headed households worked as managers in private companies or cadres in the government (Christiaensen and Boisvert 2000; Christiaensen and Subbarao 2005; Angelillo 2014). Our finding further revealed that this trend not only appears in urban areas, but also fits in rural areas in China. A potential reason could be—in the same way as urban female heads of households—that rural female heads of households are also more likely to be employed in higher positions and receive a respectable income. Moreover, the impact of a marital status of married upon the level of risk is also negative. Specifically, a marital status of married will benefit a household's income and reduce the household's vulnerability to poverty. This finding contrasts with Brody's (2003) argument that married women will decrease a household's income, and partially agrees with the view of McDowell (2005) that a husband will assist his wife in taking care of the elderly and children in the household, which will not reduce the household's income. In terms of the influence of the number of different groups upon a household's vulnerability level, the outcomes indicate that as the number of children and youth in both urban and rural households increases, there is a higher probability that they will become poor in the future. This finding stresses the significance of providing financial aid to families with more than one child or youth member. A similar result appears in terms of the number of elderly individuals. Compared to households with elders, households without elders have less chance of becoming vulnerable. It calls for a discussion surrounding the coverage of medical insurance and pension at the retirement age. As the data description section explained, this study constructs a welfare index based on five characteristics that reflect welfare in a household. Accordingly, it was found that a comprehensive welfare programme could be considered an efficient tool for both urban and rural households to buffer vulnerability.

Table 3. The impact of potential variables on the vulnerability level in urban and rural households.

	Urban	**Rural**
Dependent variable: Φ		
Explanatory variable		
Head of household: female	−0.03 *** (−7.03)	−0.06 *** (−10.29)
Age of head of household	0.06 *** (6.77)	0.04 *** (4.25)

Table 3. *Cont.*

	Urban	**Rural**
Married	−0.04 *** (−6.24)	−0.02 ** (−3.19)
Household belongs to ethnic minority	0.03 *** (3.97)	0.03 *** (4.99)
No elder	−0.01 ** (−2.79)	−0.05 *** (19.08)
More than 1 children	0.01 *** (1.21)	0.01 ** (1.14)
More than 1 youth	0.03 *** (7.46)	0.02 *** (8.67)
Belong to CPC[11]	−0.02 *** (−4.49)	−0.03 *** (−5.71)
Bad health	0.08 *** (10.26)	0.09 *** (17.85)
With local hukou	−0.03 ** (−2.06)	0.04 *** (4.46)
Coastal regions	−0.06 *** (−11.45)	−0.13 *** (−28.41)
With Long-term contract	−0.05 *** (−10.54)	−0.01 * (−1.17)
Illiteracy	0.01 * (2.15)	0.03 *** (6.83)
Demolition	0.01 ** (1.31)	−0.05 *** (−3.80)
Employed	−0.02 *** (−3.64)	−0.04 *** (−9.40)
Demolition with no compensation	0.01 ** (1.36)	0.05 *** (3.42)
Satisfy with living standard	−0.05 *** (−11.68)	−0.07 *** (−17.31)
Satisfy with economic situation	−0.02 *** (−3.75)	−0.01 *** (−3.20)
In (financial assets)	−0.10 *** (−71.17)	−0.11 *** (−99.61)
Welfare	−0.03 ** (−2.89)	−0.05 *** (−3.58)
Size of land		0.001 *** (14.30)
_cons	0.93 *** (26.82)	1.34 *** (43.98)
Number of Observations	6674	10,489
Adj R-squared	0.65	0.67

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Compared to heads of households with other types of contractual jobs, those with long-term contractual jobs are less likely to face poverty. This result provides a reasonable

explanation as to why Chinese Communist Party members show a lower risk of becoming poor. Specifically, compared to non-Chinese Communist Party members, Chinese Communist Party members are primarily employed in state-owned enterprises, government, and public sectors, which provide long-term contracts with higher job security.

In both urban and rural households, heads of households without educational qualifications are more likely to face poverty than are those with educational qualifications. However, the coefficient in rural households is much greater than that in urban households. This result indicates that the impact of educational attainment upon a household's income in rural families is higher than that in urban households. More specifically, investing in education generates rich returns, particularly in rural areas. A similar differential effect appears in coastal regions, wherein the risk of a rural coastal household becoming poor is more significant than that in urban coastal areas, though both of them are negatively correlated with the risk level. This finding provides evidence that the regional income difference is greater in rural areas than in urban areas.

As discussed in the literature review section, the critical way in which to distinguish urban and rural residents is to find out whether they own local *hukou*. With regard to urban households, the vulnerability level is low for urban local *hukou*. On the contrary, for rural households, the vulnerability level is high for rural local *hukou*. This result verifies the significance of urban *hukou* for a household's income. However, it considers only local urban *hukou*, instead of all urban *hukou*. In other words, if the efficiency of urban *hukou* for a household's income is considered, the regional difference may also need to be taken into account. What is more, when rural families face demolition, it brings about a lower risk of becoming poor, while urban households may encounter a higher probability of vulnerability. If compensation is removed, both urban and rural families face the risk of vulnerability (as expected). However, the significance of the impacts on rural households is higher than that on urban households. It brings about a further discussion regarding how the different methods of compensation after demolition affect the vulnerability level.

It is worth noting that both variables satisfying the economic situation and the standard of living are significantly negatively correlated with the vulnerability level, which proves that the subjective question of the minimum cash requirement used in this study is effective in testing a household's income and predicting a household's vulnerability in the following few years. Another interesting result is the larger land size of rural households and the higher risk of facing poverty, which contradicts expectations and requires further analysis.

5.2. Comparisons of Vulnerability Incidences and Poverty Rates between Urban and Rural Households

This study calculated the subjective poverty line for each household and set the vulnerability threshold at 0.29 and 0.50, respectively, corresponding to the probability of becoming poor in the following year and in the following two years. The poverty rate concerns the rate of a household whose adult equivalent income is lower than its subjective poverty line, while the vulnerability rate for each household is calculated via Equation (5). Figure 1[12] illustrates the comparisons of vulnerability and poverty rates between urban and rural households at different vulnerability thresholds. Nearly 5.36% of urban households earn an income below their subjective poverty line, while 12.69% of rural families have an income lower than their subjective poverty line. Both urban and rural households show a similar trend in which the total vulnerability incidence is greater than the total poverty rate, not only when the vulnerability threshold is set at 29%, but also when the vulnerability threshold is set at 50%.

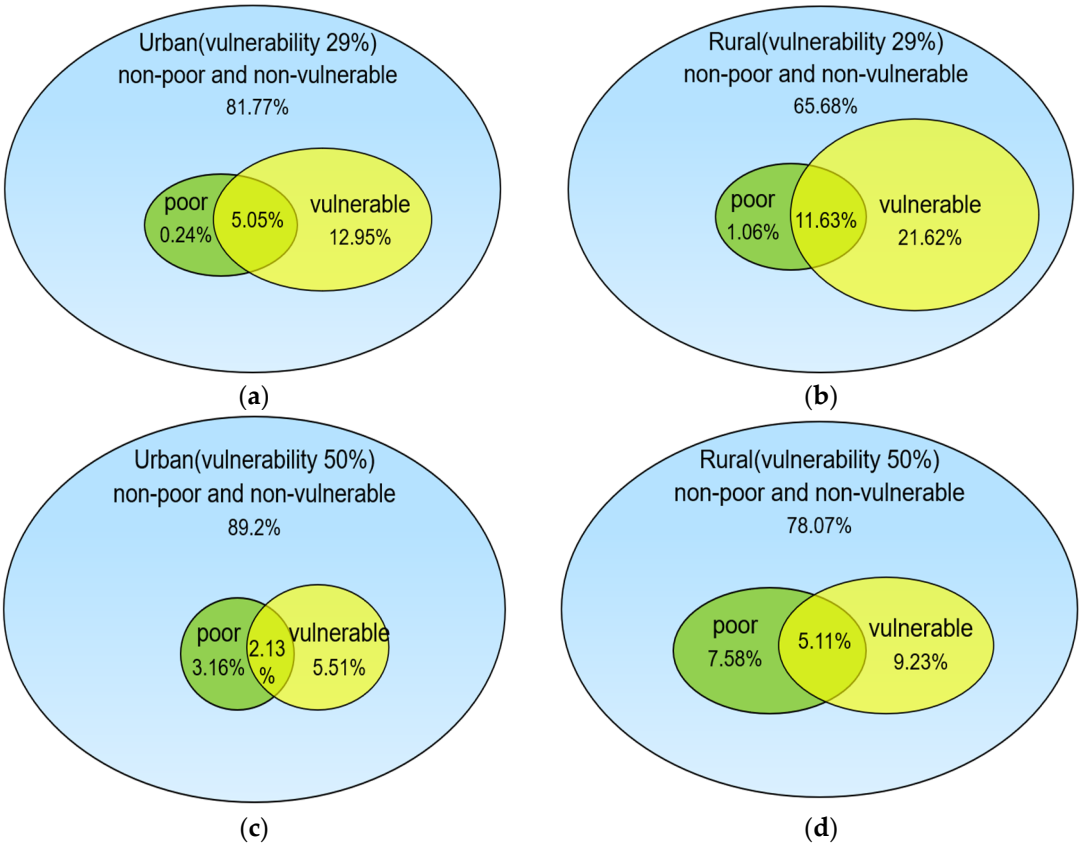

Figure 1. Classification of non-poor and non-vulnerable groups in urban (**a**,**c**) and rural (**b**,**d**) China.

With regard to urban households, 0.24% earn lower than the subjective poverty line, while their probability of being poor is lower than 29%. This figure increased to 3.16% if the vulnerability threshold was changed to 50%. Meanwhile, among the non-poor group, 12.95% face the risk of becoming poor in the following year and the percentage is halved if the risk of entering poverty in the following two years is considered. In rural areas, 1.06% of households are poor. However, their probability of becoming poor in the future is lower than 29%, which increased dramatically to 7.58% if the vulnerability threshold was set at 50%. Simultaneously, 21.62% of them face the risk of becoming poor in the following year even though they are not poor currently, and the number of target groups declined to 9.23% when the probability of entering poverty in the following two years was taken into consideration.

As expected, the poverty rates and vulnerability rates in rural households are higher than those in urban households. Meanwhile, the gap between rural and urban households in poor and non-vulnerable groups and in non-poor and vulnerable groups becomes significant, particularly at the vulnerability threshold of 29%. Specifically, the percentage of rural households suffering idiosyncratic shocks and entering poverty in the following year, though not poor, is twice that of the percentage of urban households with similar conditions. The percentage of rural households with the probability of being poor is lower than 29%. Even though their income is currently below the subjective poverty line, it is nearly five times greater than the percentage of urban households with the same conditions. A striking finding can be found in the comparisons between vulnerability at 29% and vulnerability at 50% for the poor and non-vulnerable groups in urban areas. Accordingly, the figure increased by more than 13 times when considering the possibility of becoming poor in the following one to two years, while in rural areas this figure increased only seven times. This result indicates that poor households in urban areas are more likely to get rid of poverty relative to rural households with identical conditions.

5.3. Discussions about Provincial Comparisons in Urban and Rural Households

This study calculates the percentage of households below their subjective poverty line in provinces for urban and rural households and draws provincial maps that highlight the differences among the provinces to make clear comparisons.

In Figures 2 and 3, the overall trend of the poverty rate in coastal areas, inland areas, and western areas ranges from high to low. There is relatively low poverty in both urban and rural areas in coastal areas in comparison to all other areas. It verifies that the denser transportation nets of provinces create additional opportunities and higher income for residents. However, Liaoning is an exception, which is close to the sea and shares a higher poverty rate than in several inland and western areas in both urban and rural areas. This is primarily due to outdated mechanism management, under the hits of newly industrial cities, resulting in fewer opportunities, low income, and brain drain.

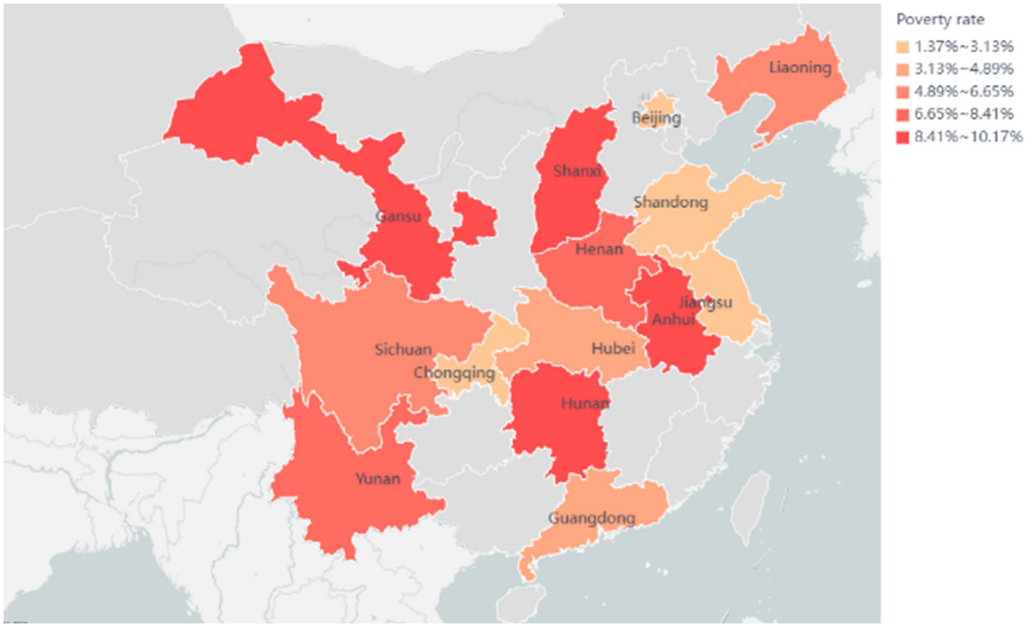

Figure 2. Urban Provincial Poverty Rate.

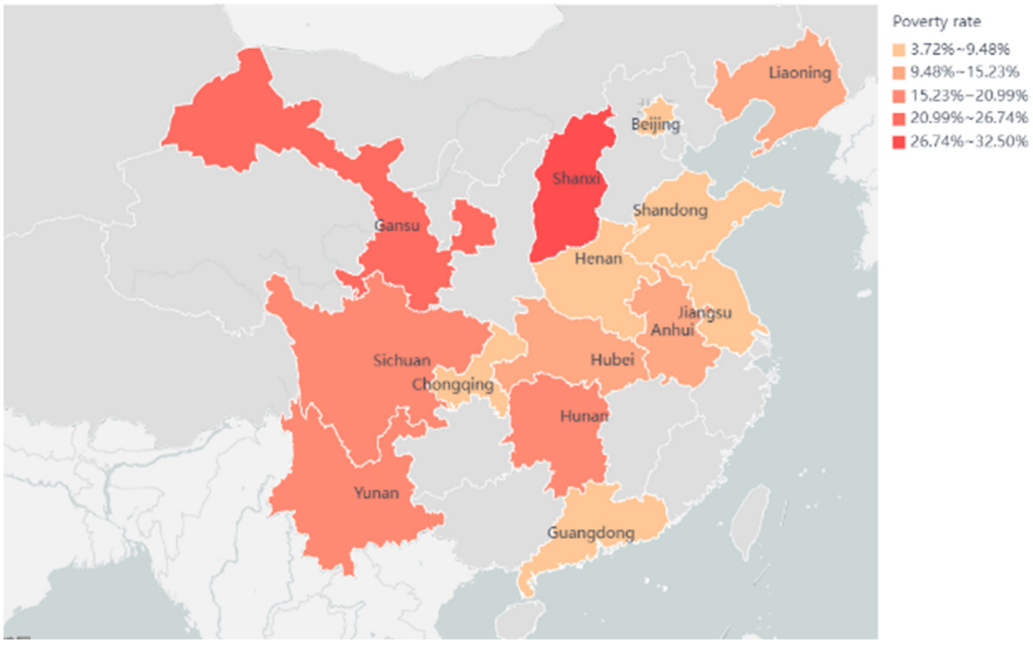

Figure 3. Rural Provincial Poverty Rate.

Remarkably, as a western city, Chongqing provides an interesting result: the number of households below the subjective poverty line is not only extremely lower than in all other western areas, but also smaller than in several coastal areas. More specifically, the poverty rate in urban Chongqing is lower than in coastal areas of Guangdong and in all other western and inland areas, while the poverty incidence in rural Chongqing is smaller than in coastal areas of Shandong and in all other western and inland areas. A potential explanation is the municipality, which is directly administered under the central government, allowing access to more sources under higher decision-making power, which helps to obtain a higher salary level that is the same as that in the provincial capital.

Figures 4–7 indicate the percentage of households with a vulnerability level higher than 29% and 50% in urban and rural areas, respectively. As expected, Liaoning exhibits a greater percentage of vulnerable households when compared to all of the coastal areas at different thresholds. Meanwhile, as western mountainous regions, Chongqing and Sichuan share a much smaller vulnerability rate relative to other similar regions, such as Gansu and Yunnan, which is considered to be a striking finding.

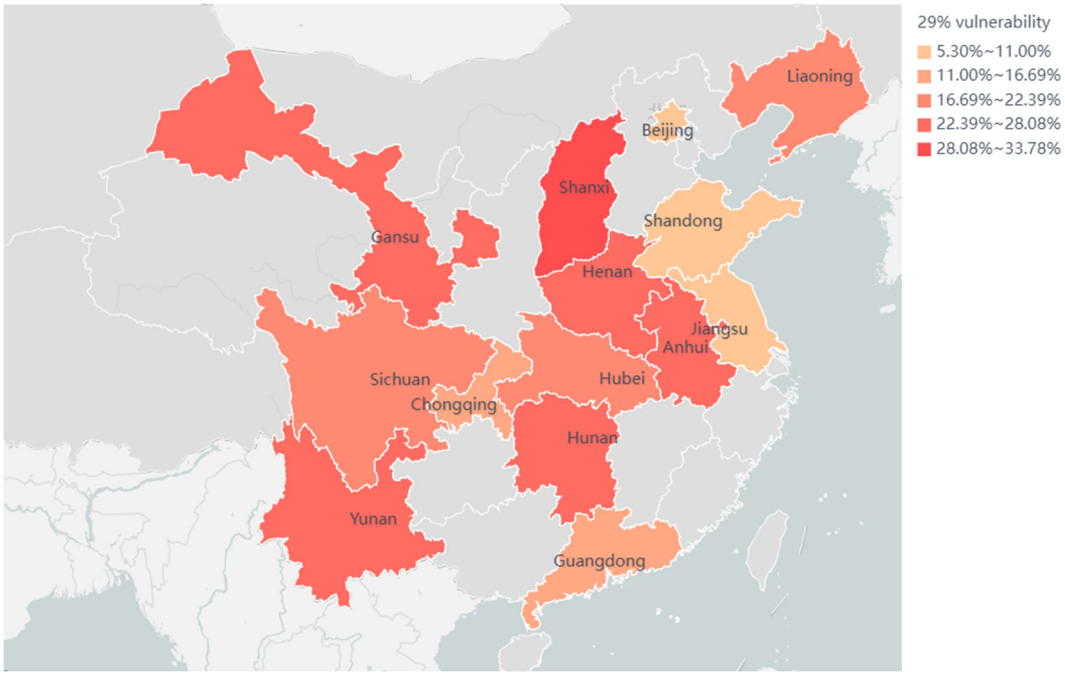

Figure 4. Urban Provincial Vulnerability 29%.

In general, Jiangsu exhibits the lowest vulnerability rate in both urban and rural regions. At the same time, Shanxi represents the highest vulnerability in both urban and rural areas. These findings question whether the age of resource-based regions, such as Shanxi, is gone. From the perspective of urban households, 6.70% of households in Beijing are vulnerable households when the vulnerability threshold is 29%, whereas this figure is smaller by nearly 1/7 times if the vulnerability threshold is changed to 50%, which shares the widest gap. Simultaneously, rural households in Guangdong represent the largest gap between 29% and 50% vulnerability levels.

If the gap between urban and rural households is considered based on the same vulnerability level, Shandong exhibits the largest gap at a vulnerability level of 29%, whereas Beijing shares the widest gap when the vulnerability threshold is set at 50%. Notably, when making a comparison between urban and rural households, Guangdong exhibits an unexpectedly higher level of vulnerability in urban households than in rural households at two vulnerability thresholds. This finding is similar to those of previous studies that suggested that urban families are more likely to establish a subjective poverty

line that is much higher than that used in rural households (Haughton and Khandker 2009).

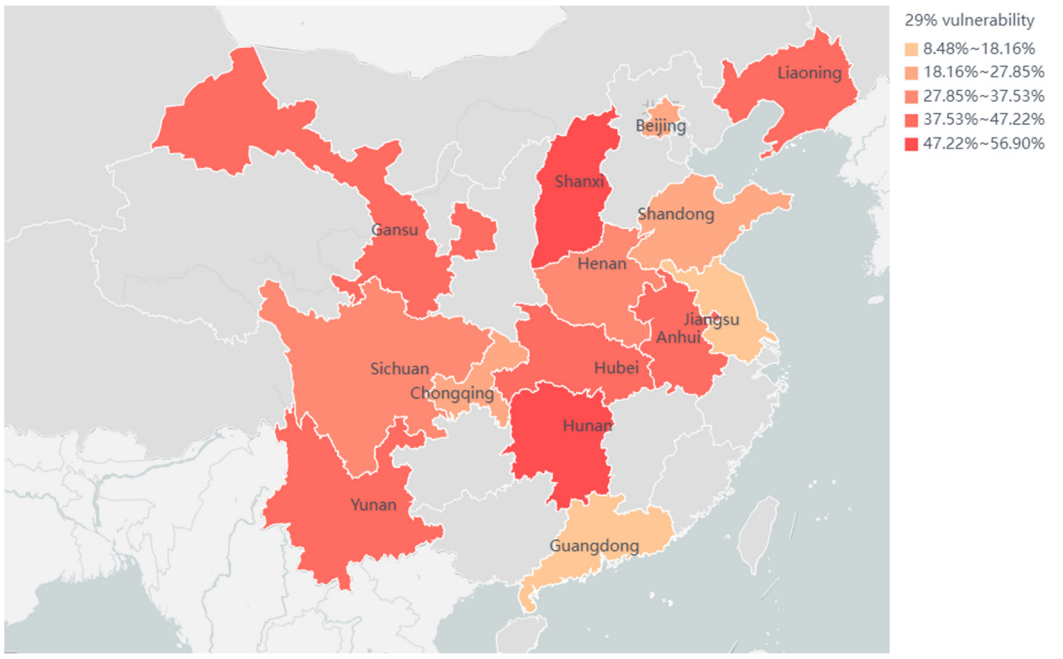

Figure 5. Rural Provincial Vulnerability 29%.

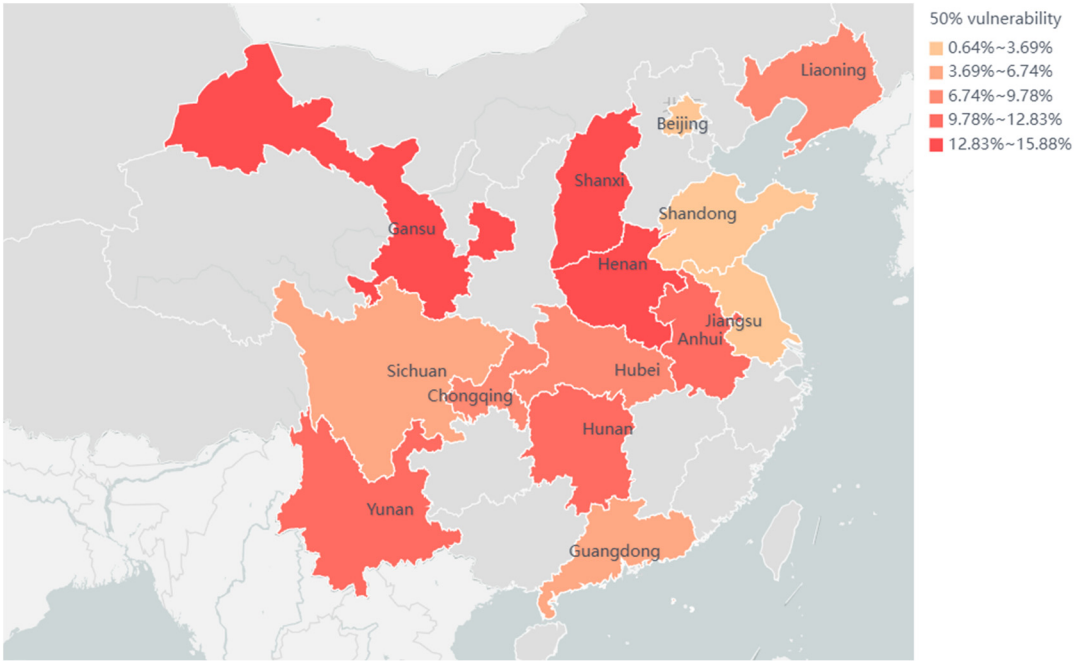

Figure 6. Urban Provincial Vulnerability 50%.

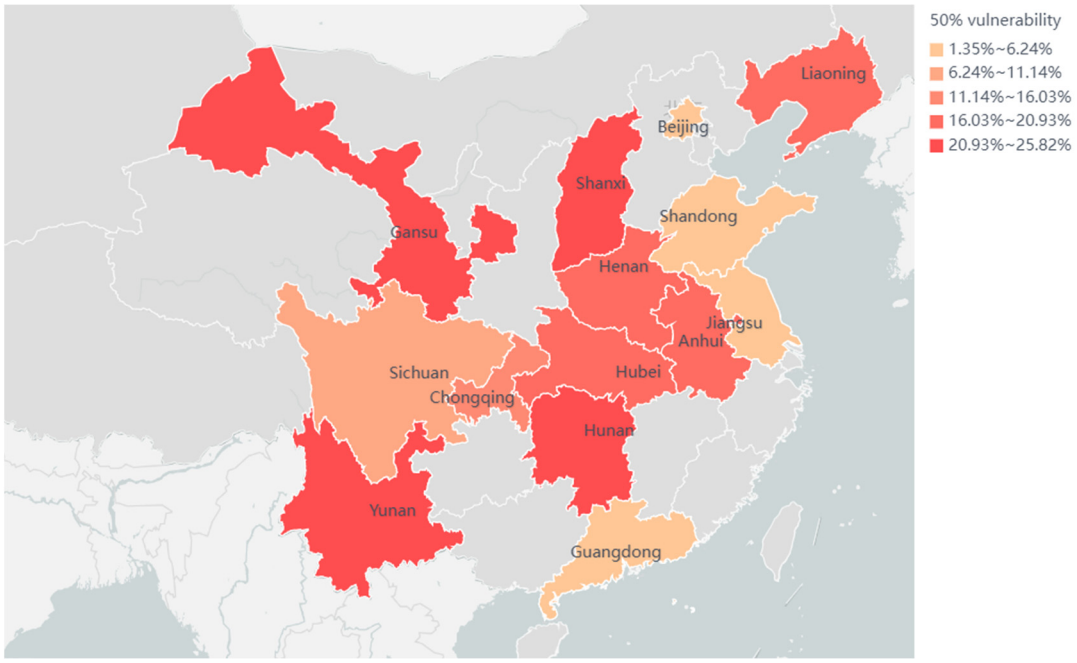

Figure 7. Rural Provincial Vulnerability 50%.

5.4. Discussion about Poverty and Vulnerability Profiles

We calculated the poverty rates and vulnerability incidences for households with different characteristics, respectively. For example, I divided the heads of households into three groups based on age: the first group concerns heads of households aged below 30, the second group concerns those aged between 30 and 60, and the last group concerns those aged above 60. Furthermore, we calculated the percentage of poverty and vulnerability of heads in each age group and made comparisons among them. Figure 8 indicates that the percentage of heads aged below 30 in urban households is significantly smaller than those of the other two groups in terms of the poverty rate and vulnerability incidence. In other words, the gap in vulnerability and poverty rates between households headed by individuals aged below 30 and those aged 30 to 60 and between households headed by individuals aged below 30 and those aged above 60 is dramatically wider than that between those aged 30 to 60 and those aged above 60. Although in rural households (Figure 9) the total trend increased with age, and the poverty and vulnerability rates become greater in a similar manner to that of urban households, the difference in poverty and vulnerability rates between households headed by those aged below 30 and households headed by those above the age of 60 is much greater than that between those aged below 30 and those aged 30 to 60. More specifically, in urban areas, younger heads of households aged below 30 are less likely to face poverty in the future. Meanwhile, when the age of the household owner is above 60, there is a higher likelihood of becoming poor in the following one and two years when compared to the same group in rural and urban groups.

In urban households, an increase in the number of children brings about a higher probability of entering poverty in the following one and two years. However, the percentage of households with one child that fall below the subjective poverty line is lower than those with no children, which is unexpected. The same result appears in rural households. In contrast to urban households, households with one child exhibit the lowest probability of being poor when compared with households without children and those with more than one child at different vulnerability thresholds. A potential explanation could be that, different from urban households, the majority of rural family members work on their own lands, which enables them to bring one child to the workplace. In the meantime, the child is taught to perform some auxiliary work. On the one hand, it decreases expenditure on babysitters. On the other hand, it quickens their progress on the land.

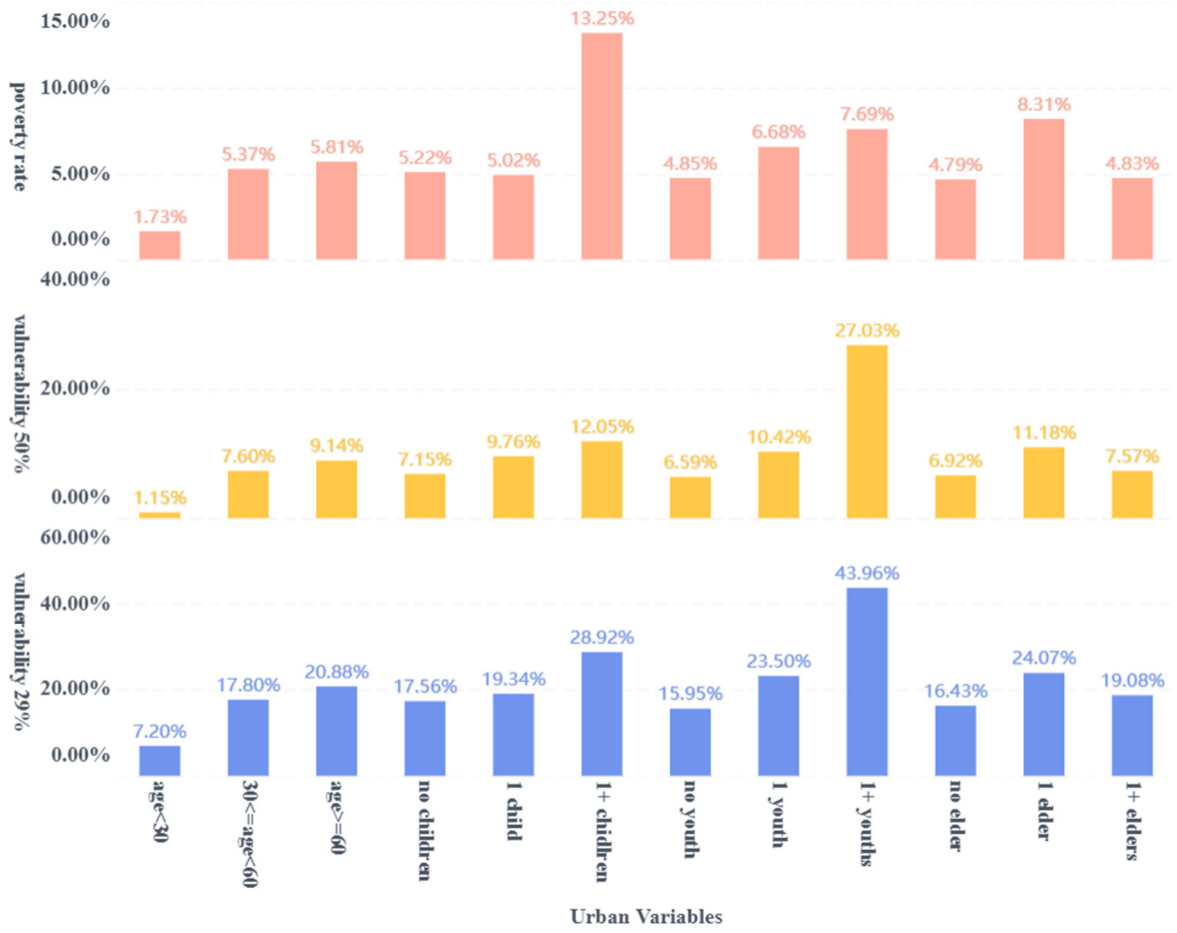

Figure 8. Poverty and vulnerability categories for urban variables related to age and number of different groups.

There is a remarkable difference between families with no youth and those with more than one youth in urban households with vulnerability at 29% and 50%, although a slight gap between them exists with regard to the aspect of the poverty rate. Unlike urban households, the probability of families without any youth and families with one youth member becoming poor in the following one or two years is almost the same as in rural households.

If there is a concern surrounding the impact of the number of the elderly in a household upon the vulnerability incidence, an interesting result is observed when one elder exists in urban families. The probability of entering poverty becomes the largest, compared to cases without an elderly member and those with more than one elder. However, in rural households, having more than one elder in the household makes the household more vulnerable to poverty. In contrast to having one elder, single elders in households may require more attention and care, which could accompany each other. Extra care incurs additional expenditure on elder sitters in urban areas and they are more likely to push the household into poverty. Meanwhile, the coverage of pension in rural households is incomplete, which was also implied in several previous studies and could explain why having more than one elder in rural households makes them more vulnerable (Oksanen 2010; Angelillo 2014).

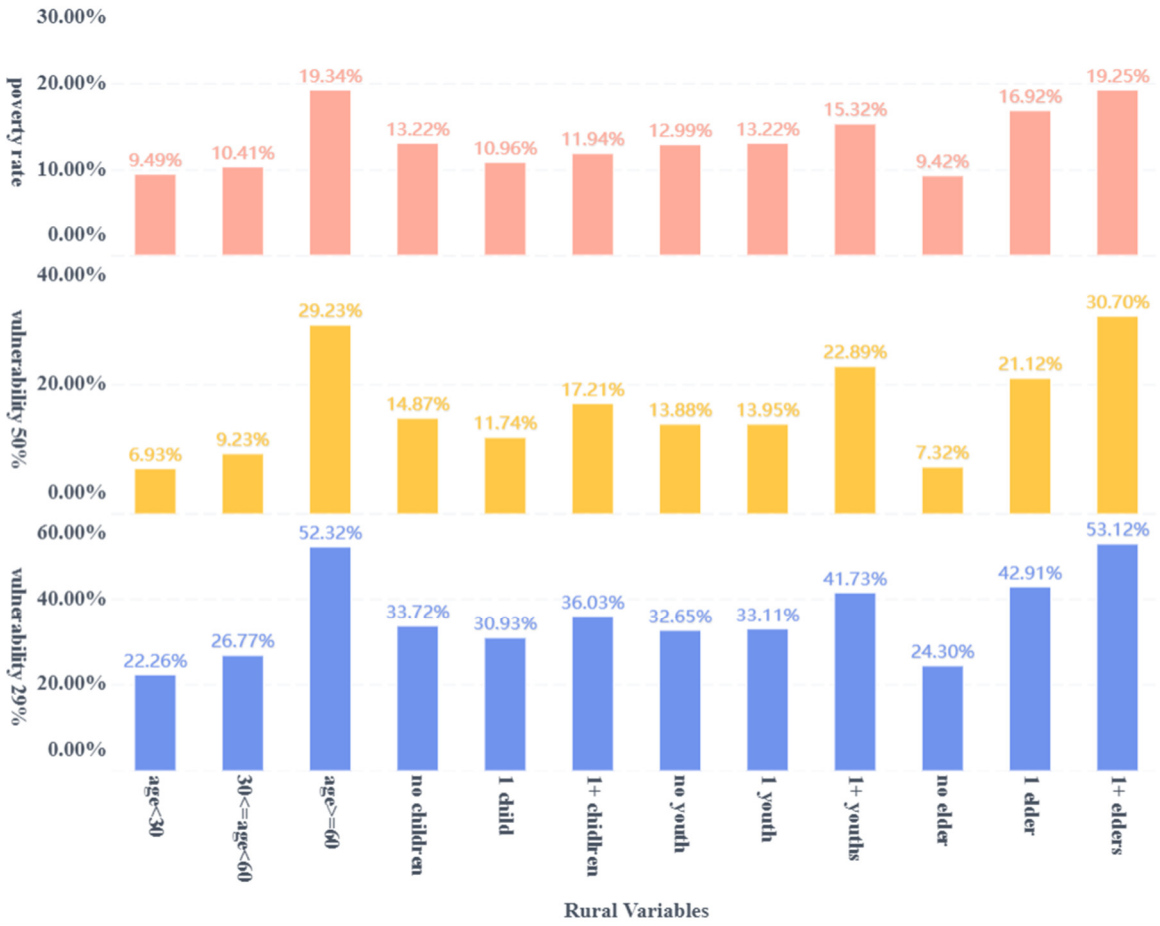

Figure 9. Poverty and vulnerability categories for rural variables related to age and number of different groups.

Figures 10 and 11 describe the impacts of variables related to employment upon poverty and vulnerability rates. They deviate slightly from expectation, with heads of households with an educational level lower than a senior school degree exhibiting the highest poverty rate and vulnerability incidence. Meanwhile, the figures are even greater for those without any educational attainment. As free and compulsory primary education[13] has been provided in China since the 1990s, the number of students completing education has been growing quickly. Following this, a certain number of students have chosen to quit and turn to the labour force market due to a series of reasons, such as household poverty and a lack of senior schools in their locality. This provides an excessive labour force with individuals with less than a senior school degree (Cui et al. 2018; Wang and Benjamin 2019). However, citizens are not illiterate. Thus, they have to face the dilemma of not obtaining jobs due to the limitation of schooling. Simultaneously, they are not willing to work as manual workers, like most illiterates do. In rural areas, heads of households without educational qualifications exhibit the highest probability of entering poverty in the following one to two years and have the greatest poverty rate in comparison to literate groups. Meanwhile, households headed by those with more than 12 years' schooling present the lowest probability of being poor. All of this shows that in rural areas, the educational level plays a critical role in getting rid of poverty and vulnerability to poverty, which stresses the importance of universally accessible primary education in rural areas.

In both urban and rural households, having no contract is regarded as the main threat to the heads of households getting rid of poverty and alleviating vulnerability to poverty. Meanwhile, a long-term contract could be an efficient tool with which to buffer poverty and vulnerability.

Importantly, there is no significant difference in poverty and vulnerability rates between an employed and a retired head of a household in urban areas, though households headed by unemployed individuals exhibit the highest probability of poverty and being vulnerable to poverty. However, retired heads of households are more likely to be poor than are those who are employed in rural areas. The results reiterate that the coverage of pension in urban and rural areas is significantly different and indicate that the coverage of pension is more complete in urban areas.

Admittedly, the compensation system for dismantled households is not transparent. However, this study applied a household questionnaire survey to provide useful information on the relocation compensation standard being unfair in urban areas, which is reflected in dismantled households, who are more likely to be vulnerable than households without demolition. Meanwhile, urbanisation has hiked the prices of houses in central areas and the most developed urban regions, making it difficult for dismantled households to buy a house in their original location with the same conditions. As a result, they are forced to move to suburbs with covariate shocks and face the risk of becoming poor. Interestingly, urban and rural households present opposite results with regard to the impact of demolition upon the incidences of poverty and vulnerability. Compared to urban areas, dismantled households in rural areas find it easier to purchase a new house with the same conditions within proximity of their original home, which is less likely to increase the impact of covariate shocks upon the vulnerability level.

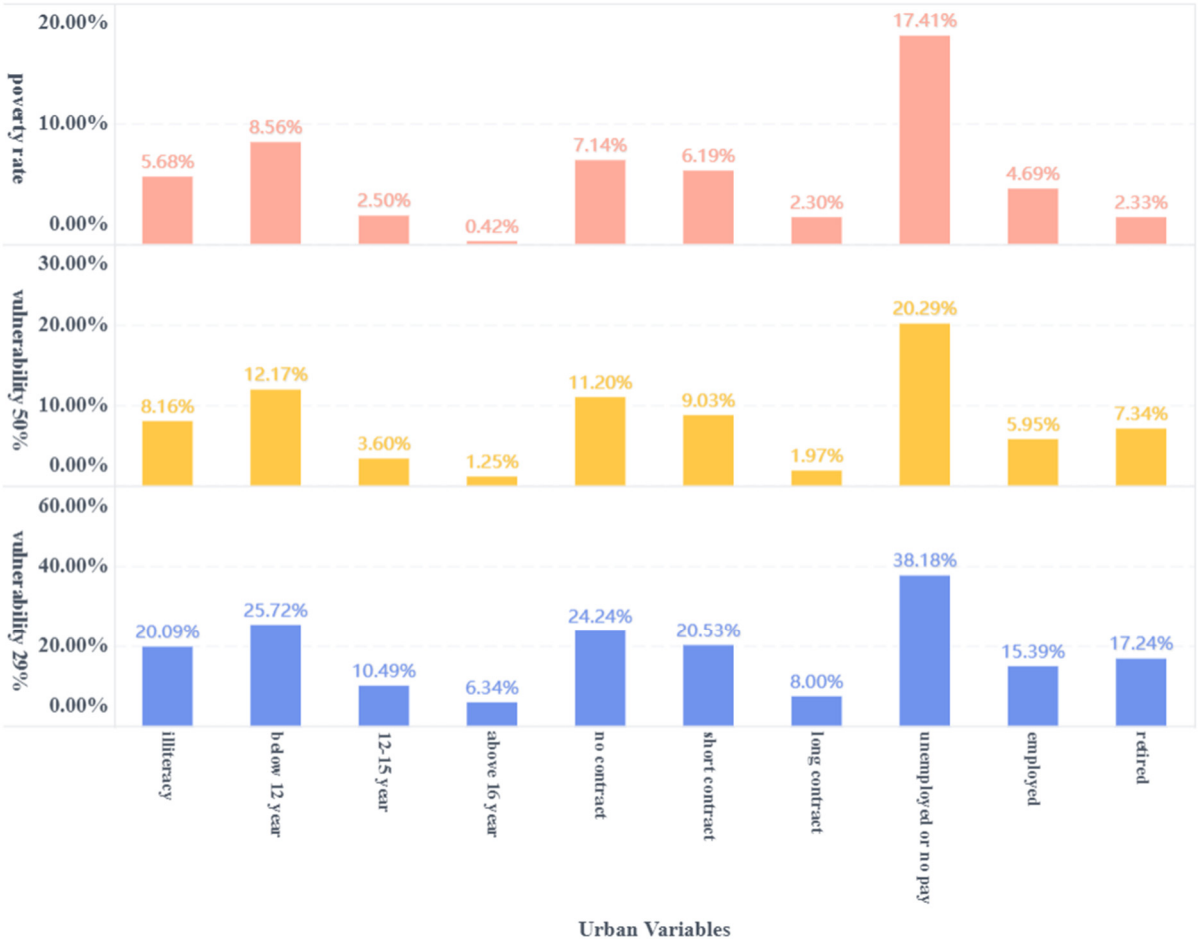

Figure 10. Poverty and vulnerability categories for urban variables related to employment.

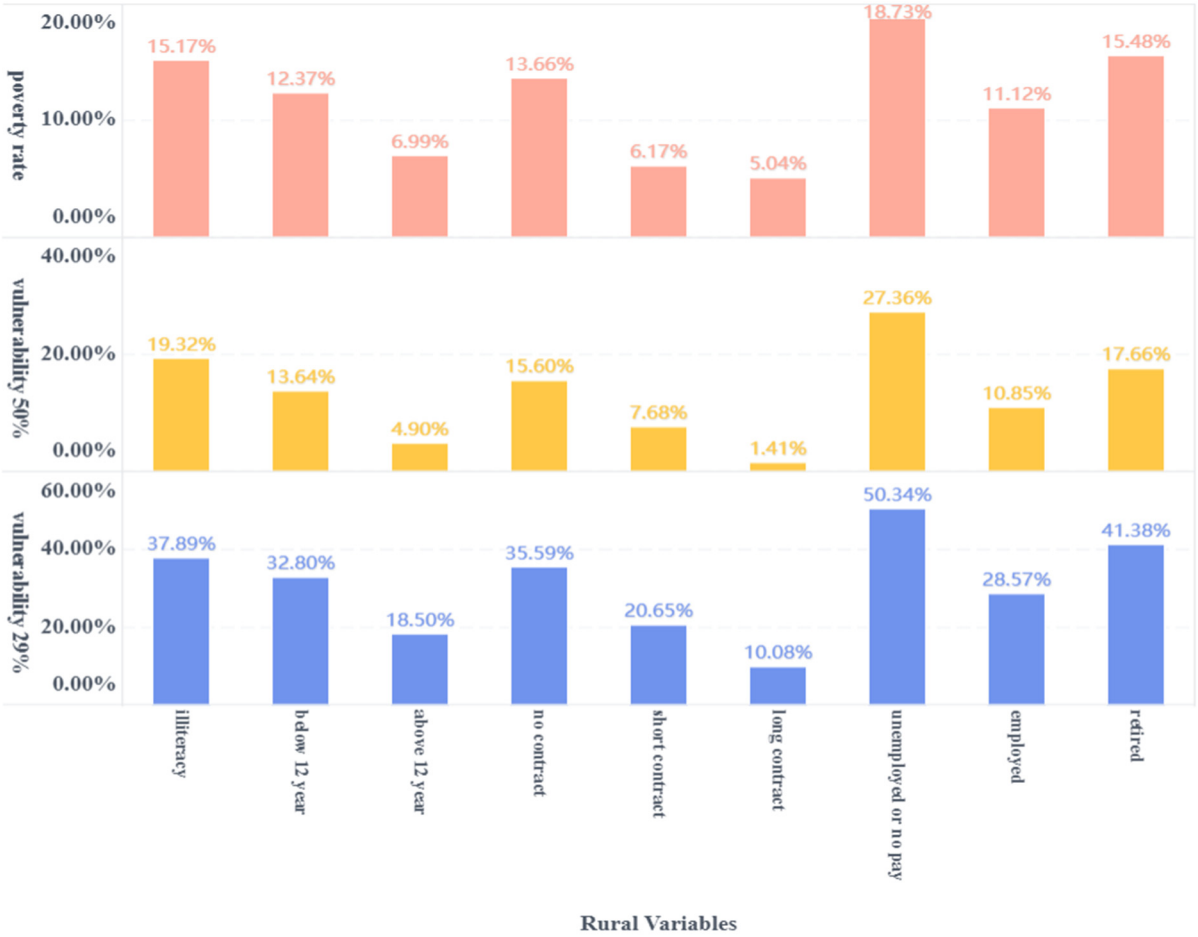

Figure 11. Poverty and vulnerability categories for rural variables related to employment.

As expected, in Figures 12 and 13, for both urban and rural areas, no compensation is more likely to push a household towards being poor in the years following demolition. Meanwhile, obtaining dual compensation (including money and housing) benefits them in buffering vulnerability in both urban and rural areas. A striking finding is that the poverty rate for households obtaining dual compensation is higher than for those receiving only money as compensation. Niu (2014) suggests that a potential explanation is perhaps that a compensated house may be difficult to sell, as the location is not always attractive and the financial compensation in dual compensation is not generous, which creates financial burdens on these households.

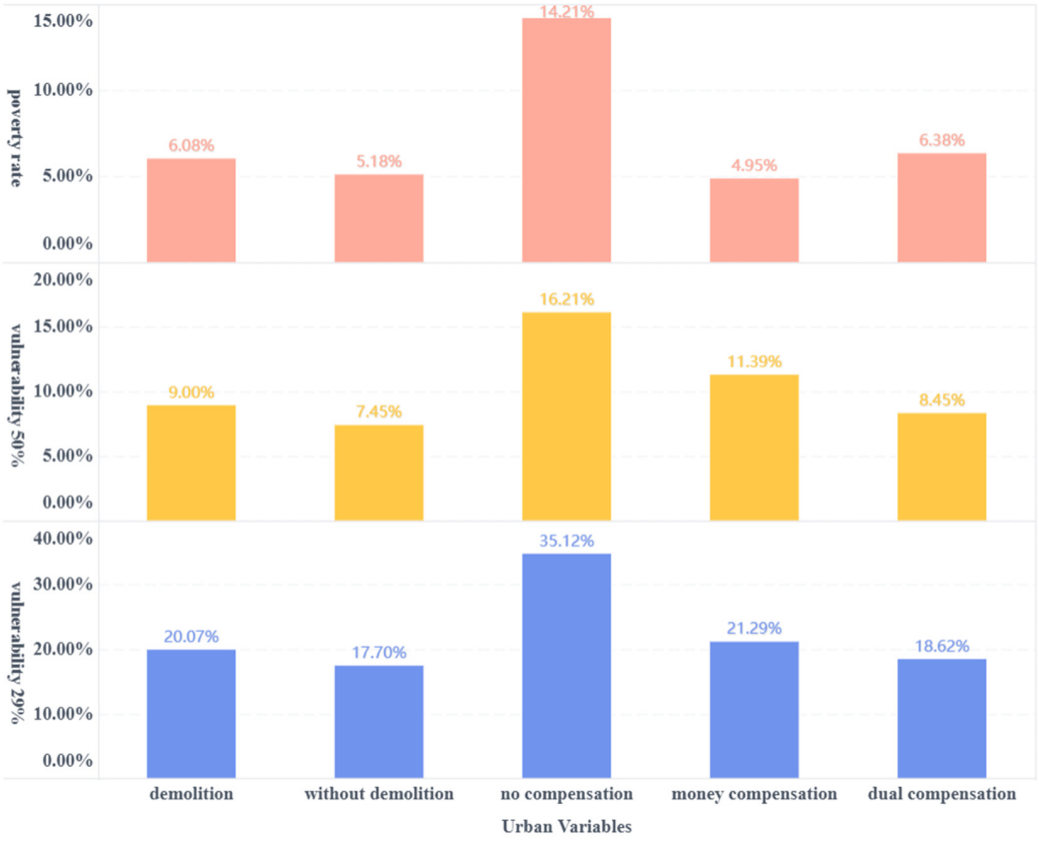

Figure 12. Poverty and vulnerability categories for urban variables related to demolition.

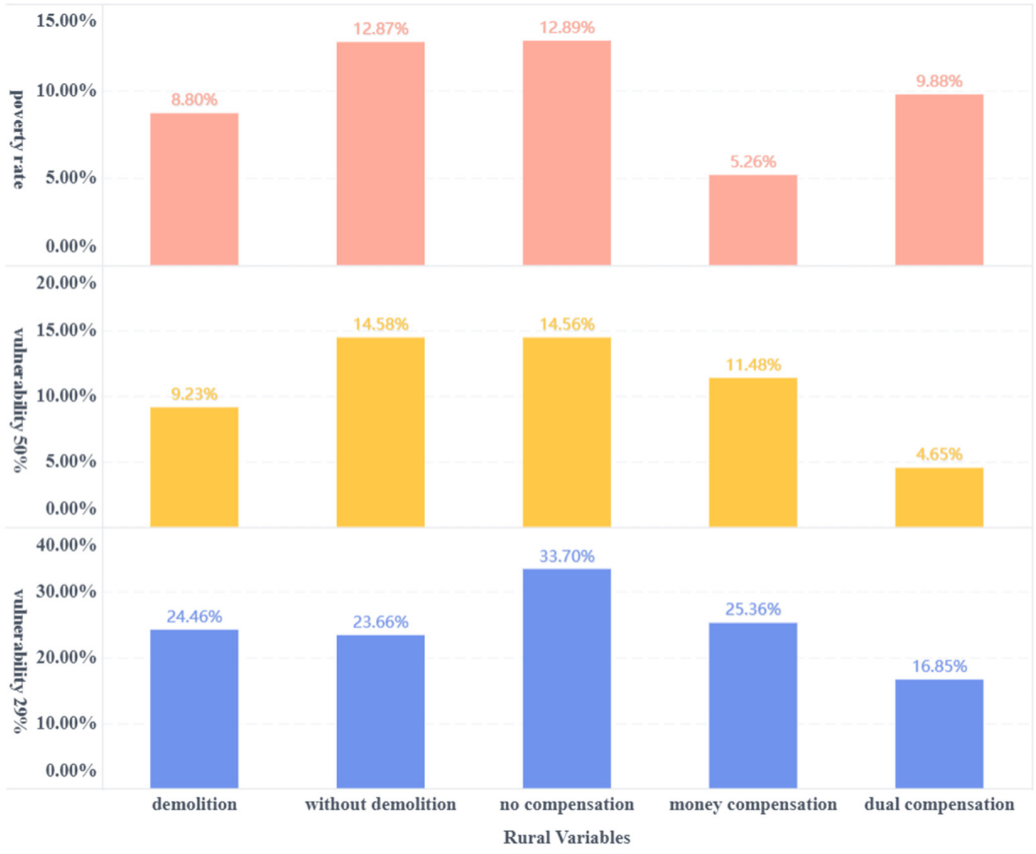

Figure 13. Poverty and vulnerability categories for rural variables related to demolition.

5.5. Discussion about Multidimensional Study of Vulnerability

To distinguish vulnerable households from non-vulnerable households, this study uses the multidimensional method, Table 4, to observe which households are deprived in some particular dimensions closely related to being poor in the near future. Following the method suggested by Alkire and Foster (2011), this study selects a list of indicators and identifies a cut-off point for each indicator. Subsequently, a weight is assigned to the dimensions based on various criteria. Unlike those that stress the significance of specific dimensions and allocate a greater weight to those than to others, this study assigns an equal weight to all dimensions and equally divides into its nested indicators.

Table 4. Measurement indices of multidimensional vulnerability.

Dimension	Indicator	Deprivation Cutoff
Economic (1/4)	Household income (1/8)	Household income lower than subjective poverty line is 1; Otherwise, is 0.
	Durables (1/8)	If total value of durables and financial assets minus debts lower than the expected *the number of adults is 1; Otherwise, is 0.
Education (1/4)	Illiteracy (1/12)	At least one adult in household illiteracy is 1; Otherwise, is 0.
	Children (1/12)	At least one child drop out in the household is 1; Otherwise, is 0.
	Youth (1/12)	At least one youth drop out in the household is 1; Otherwise, is 0.
Health (1/4)	Bad health (1/4)	At least one member has bad health condition is 1; Otherwise, is 0.
Employment and Social security (1/4)	Without stable job (1/12)	At least one adult family member is unemployed or no pay is 1; Otherwise, is 0.
	Lack of Medical insurance (1/12)	More than one adult does receive medical insurance 0 is 1; Otherwise, is 0.
	Lack of Pension (1/12)	More than one adult does receive pension when they are in retirement age is 1; Otherwise, is 0.

As the discussion surrounding the impact of employment and the number of elders upon the vulnerability incidence brings attention to pension and medical insurance, based on the original model, which considers only living standards, educational qualifications, and health, this study also considers employment and social security dimensions in the multidimensional analysis of vulnerability.

This study combines the results from the discussions above with those from previous studies, defining those households with deprived indicator weights above 0.4 as vulnerable (Alkire and Foster 2011; Angelillo 2014; Artha and Dartanto 2015). Figure 14 shows the comparison between urban and rural households in terms of deprived indicators. Regarding urban households, there are 4.2% vulnerable households and the primary determinants of being vulnerable include a lack of job security and a lack of medical insurance. Among rural households, 10.98% of them are vulnerable, which is twice the proportion in urban areas. Thus, a lack of educational attainment, poor pension coverage, and a lack of paid employment are key obstacles in getting rid of a household's vulnerability. It is worth noting that, compared to urban households, a higher number of rural households have received medical insurance, primarily due to the recent efforts of the universal New Rural Cooperative Medical Scheme (NCMS). Meanwhile, the pension coverage in rural households is significantly narrower than that in urban households, which explains why

the number of elderly members is positively related to the risk of being poor. Consequently, it calls for more attention and action from local government.

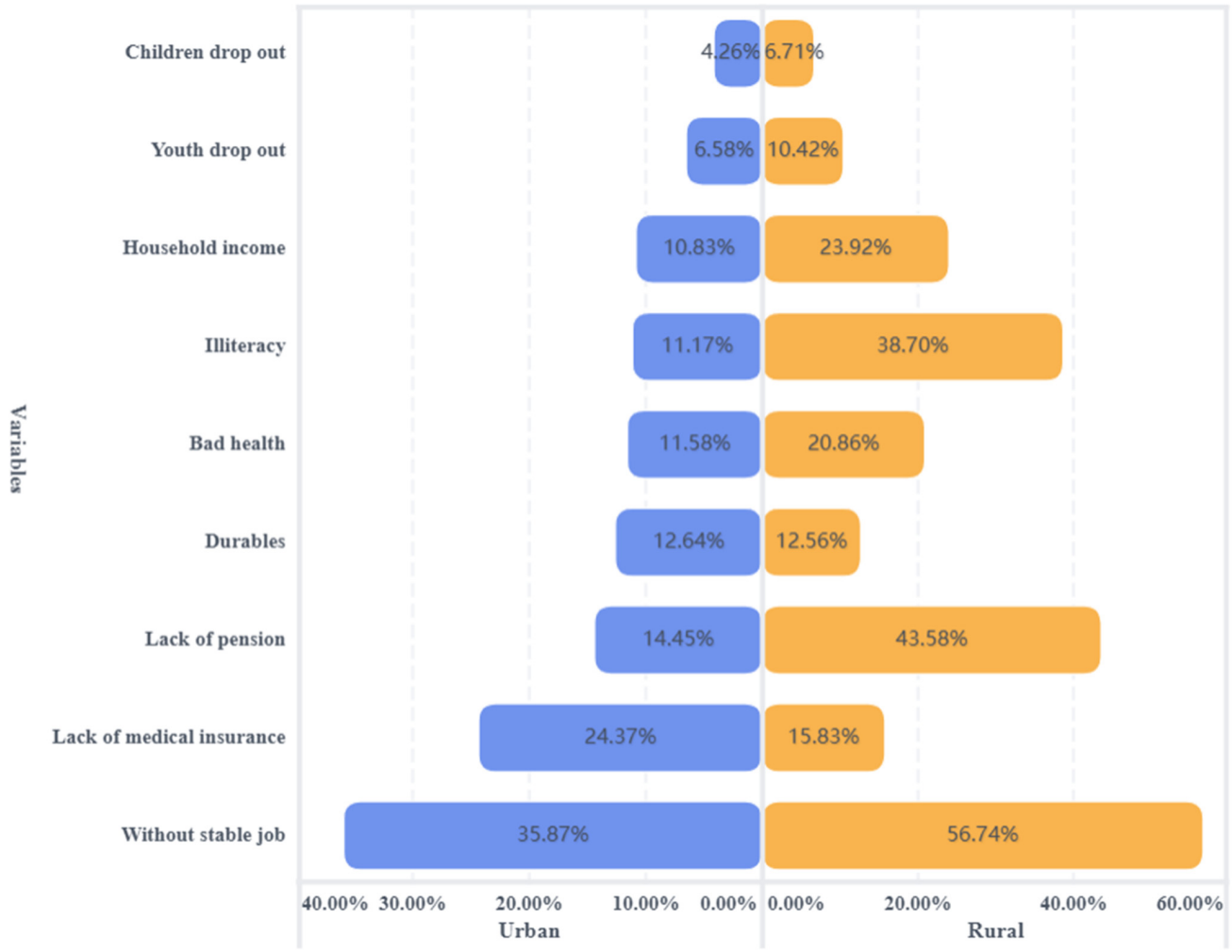

Figure 14. Multidimensional analysis of vulnerability.

6. Conclusions

This study determines a subjective poverty line for each household based on the minimum cash requirement and actual household income. In doing so, vulnerability is defined as the probability of a household becoming poor in the following years. FGLS estimators are applied in order to adjust the problem of heteroscedasticity in a cross-sectional Chinese household survey. As expected, the results show that the overall vulnerability incidence in urban households is lower than in rural households. Moreover, the results highlight the striking difference among urban households in terms of poverty and non-vulnerability at different vulnerability thresholds. In other words, as time passes, more urban households are likely to experience poverty, which contrasts with the findings measured from the absolute poverty line. It stresses the significance of measuring vulnerability by means of the subjective poverty line, which calls for additional financial aid from the government while reflecting human suffering. As a western region, Chongqing shows a relatively low incidence of poverty and vulnerability in both urban and rural households, which contradicts the expected results and questions whether welfare levels and urbanisation development in western regions have a higher influence on poverty levels than in inland areas. In addition, this study observes that in Guangdong, the probability of an urban household becoming poor in both the following year and in the following two years is greater than that of rural households, which stresses the effects of infrastructure on buffering such vulnerability, as

rural Guangdong owns a greater number of roads and rail networks than does any other rural area, thus connecting residents with outsiders.

Educational qualifications are still a determinant of the vulnerability of rural residents. Although the compulsory nine-year primary education scheme was launched decades ago, a considerable number of rural residents are still illiterate. The significant difference between urban and rural residents concerning educational attainment is still prevalent. In other words, rural children should be allowed to access a fair educational environment. Meanwhile, the coverage of pension in rural households is incomplete, which brings about the positive impact of the number of elders upon the rates of poverty and vulnerability. In other words, although the new rural pension scheme was launched in 2008, as of 2014, there is still a long way to go, and the current status is further away from its purpose of guaranteeing easy access to 80% of rural residents to pension benefits.

The New Cooperative Medical Insurance Scheme is the main medical insurance scheme in rural China, and even in 2014, our findings indicated that the coverage of medical insurance in rural households was more complete than in urban households, becoming an efficient tool with which to mitigate the risk of facing poverty.

According to the results, economic growth in China has resulted in disparities in the distribution of wealth between urban and rural regions, particularly in terms of the risk of being poor. It calls for more social reforms to mitigate the risk and buffer the vulnerability. Accordingly, this study recommends that the Chinese government adopt a more equalising approach, instead of unrestrained growth.

Funding: This research received no external funding.

Data Availability Statement: The data is available in http://ciidbnu.org/chip/chips.asp?year=2013&lang=EN.

Conflicts of Interest: The authors declare no conflict of interest.

Appendix A

Table A1. Scoring coefficients for the social security index in urban.

Variable Names	Coefficient
Medical insurance	0.2502
Unemployment insurance	0.4045
Work injury	−0.1558
Housing fund	0.4736
Pension	0.2790
Mean	0.00
Standard Deviation	1.00

Table A2. Scoring coefficients for the social security index in rural.

Variable Names	Coefficient
Medical insurance	0.2072
Unemployment insurance	0.2233
Work injury	0.1255
Housing fund	0.4391
Pension	0.3739
Mean	0.00
Standard Deviation	1.00

Appendix B. Vulnerability Incidence and Poverty Rate in Urban and Rural Areas

Table A3. Vulnerability 29%.

	Urban	Rural
Poor and vulnerable	5.05%	11.63%
Poor and non-vulnerable	0.24%	1.06%
Non-poor and non-vulnerable	81.77%	65.68%
Non poor and vulnerable	12.95%	21.62%
Total vulnerable	18.00%	33.25%
Total poverty	5.29%	12.69%

Table A4. Vulnerability 50%.

	Urban	Rural
Poor and vulnerable	2.13%	5.11%
Poor and non-vulnerable	3.16%	7.58%
Non-poor and non-vulnerable	89.20%	78.07%
Non poor and vulnerable	5.51%	9.23%
Total vulnerable	7.71%	14.34%
Total poverty	5.29%	12.69%

Appendix C. Blinder-Oaxaca Decomposition of Differences in Vulnerability between Rural and Urban Households

Table A5. Decomposition for group 1 and 2.

Variables	Coefficient	Std. Err.	95% CI	
Group 1 (Rural)	0.224	0.003	0.219	0.229
Group 2 (Urban)	0.139	0.003	0.134	0.144
Difference	0.084 ***	0.004	0.077	0.091
Explained	0.065	0.006	0.054	0.076
Unexplained	0.019	0.007	0.062	0.032

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

Table A6. Decompostion for explained and unexplained variables.

	Explained				Unexplained			
Variables	**Coefficient**	**Std. Err.**	**95% CI**		**Coefficient**	**Std. Err.**	**95% CI**	
Welfare	0.034	0.005	0.024	0.044	−0.002	0.001	−0.004	−0.001
Socioeconomic characteristics	0.002	0.001	0.001	0.004	0.001	0.001	0.001	0.002
Demographic characteristics	0.026	0.002	0.021	0.030	0.017	0.001	0.015	0.020
Geographic characteristics	0.003	0.001	0.002	0.003	−0.008	0.003	−0.015	−0.001
Constant					0.011	0.008	−0.004	0.026

Description of the variables. Socioeconomic characteristics: employment; contract. Demographic characteristics: age; marital status; gender; ethnicity; health; hukou status. Geographic characteristics: province.

Notes

1 China set its absolute poverty line in 2011 at 2300 RMB per annum at 2010 constant prices. The amount was equivalent to 340 US dollars.

2 The open-door policy consists of two major types of policy change: the opening-up of geographical regions to foreign investment (Guangdong, Shenzhen, Fujian, Liaoning and Shandong provinces), and the opening-up of specific institutions nationwide.

3 In developed regions, such as Shanghai and Beijing, the payment was higher than 8000 RMB per annum in 2015, while in less developed regions, such as Anhui and Henan, the payment was merely 4500–4800 RMB per annum (www.nrra.gov.cn, accessed on 27 July 2022).

[4] The rate at which economic needs change with household size.

[5] The scoring coefficient is presented in Appendix A. (Tables A1 and A2).

[6] CPC is short for The Communist Party of China.

[7] Assign the demolition as 1 if the household's property is demolished within the past 2 years. Otherwise, assign the demolition as 0.

[8] See notes 6 above.

[9] The province dummies are employed as an independent variable for urban households. The mean village income is utilised as an independent variable for rural households.

[10] The value of 0.29 is considered to be the lower threshold for the measurement of a household's vulnerability to poverty, while the value of 0.5 is regarded as the upper threshold for the measurement of a household's vulnerability to poverty (Khan and Riskin 2001; Chaudhuri et al. 2002; Imai and Azam 2012).

[11] See notes 6 above.

[12] Details of the poverty rates and vulnerability incidences in urban and rural China are presented in Appendix B.

[13] Free and compulsory primary education in China refers to nine-year education (including primary and junior school education).

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