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Rural Aging and Urban-Rural Income Gap

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Abstract

Based on China's urban-rural dual economic structure, this paper mainly explores the relationship between the aging of the rural population and urban-rural income inequality since 2000, and constructs inter-provincial panel data from 2000 to 2017 in China to measure the correlation between the two. The research conclusion of this article is: There is a significant positive relationship between the aging of the rural population and the income gap between urban and rural areas. The research results reveal the important mechanism of rural surplus labor flow to the urban sector under the condition of dual economy, which has reshaped the rural age structure and exacerbated urban-rural income inequality. Based on this, this article proposes relevant policy inspirations to deal with the adverse effects of the aging of the rural population.

Keywords

Rural population; aging; urban-rural income gap; dual economic structure.

1. INTRODUCTION AND LITERATURE REVIEW

Income inequality between urban and rural areas and the aging of the rural population are two major issues facing China's socio-economic development. The Chinese government urgently needs to deal with two major challenges. Specifically, in terms of urban and rural income inequality, since the reform and opening up, China's economic development level and people's living standards have been continuously improved, but the income gap, especially the income gap between urban and rural residents, has shown a growing trend. From 1978 to 2017, the relative gap between the per capita income of urban and rural residents in China increased from 2.57 times to 2.71 times, and the absolute gap widened rapidly from 209.8 yuan to 22964 yuan. The report of the 19th National Congress of the Communist Party of China has clearly pointed out that the main contradiction in our society is the contradiction between the people's increasing needs for a better life and unbalanced and insufficient development. A large number of empirical studies show that China ’s income gap is largely manifested as the income gap between urban and rural areas. For example, Hong Xingjian (2008) found that more than half of the overall inequality contribution rate was derived from the inequality between rural groups through the decomposition of the overall Gini coefficient . With regard to the aging of the rural population, since the reform and opening up, the phenomenon of population aging in rural areas is higher than that in urban areas, which has been manifested as the number of deeply aging villages and super-aging villages has increased significantly (Wang Hongxia, 2019) ; The increasing ageing of the population seems to be exacerbating “rural diseases” (Liu Yansui, 2013) and increasing the gap between rural and urban areas. Therefore, in the context of the aging of the rural population and the growing urban-rural income inequality, it is of practical significance to study the effects of aging on urban-rural income inequality.

As more and more countries have entered the aging society, scholars at home and abroad have begun to scramble to study income inequality from the perspective of age structure. Paglin (1975) first attempted to quantify the impact of the age structure of the population on the

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income gap. He decomposed the Gini coefficient into the age Gini coefficient and the Paglin Gini coefficient, and used US household population data to find that age differences increase income inequality. Mookherjee and Shorrocks (1982), on the basis of Paglin (1975), pointed out that the decrease in interaction effects within and between age groups will reduce the Gini coefficient. Repetto (1977) builds a model based on population theory, using the fertility rate equation, the income distribution equation, and the infant mortality equation, and found in data tests in 68 countries that a decline in fertility will reduce income inequality. Morley (1981) extended Paglin (1975) 's method and tested it with Brazilian data to find that the younger age structure caused by immigration has an income gap. Deaton and Paxson (1994) first applied the permanent income hypothesis to the analysis of the effects of population aging on income inequality, and constructed the most classic theoretical basis in this field. Deaton and Paxson (1997) used the PIH hypothesis, time preference rate, and quadratic utility function proposed by Hall (1978) to construct the theoretical basis that optimal intertemporal selection follows a martingale process, and used household surveys in the United States, United Kingdom, and Taiwan The data confirm that income and consumption inequality within the same age group increases with age. Ohtake and Saito (1998) extended the decomposition method of Deaton and Paxson (1997) to use Japanese household survey data from the 1980s to analyze the reasons for the rapid increase in consumption inequality in Japan during this period. Ohtake and Saito (1998) 's research methods have also been cited by domestic scholars, such as Qu Zhaopeng (2008). He took the lead in studying the impact of domestic aging on income inequality. He used CHIP in 1988, 1995, and 2002. Three-year micro-data, using the variance and regression decomposition methods in Ohtake and Saito (1998) to decompose the total consumption and income inequality in rural China into inequality among birth groups, inequality within birth groups, and aging effects, It was found that the effect of aging on inequality is very small. Since then, Guo Wangqing (2011), Liu Hua (2014), Wang Mengdi (2019), etc. have successively used this method to conduct research on aging and income inequality. Some other scholars have examined the effect of population aging on income inequality from the perspective of Gini coefficient decomposition, but the essence is similar to the variance decomposition method, which is to decompose income inequality into age groups, such as Zhong (2011) using WVW decomposition Method to analyze income inequality in China; Liu Jindong et al. (2014) derived the expression of the aging effect based on the Gini coefficient, and defined the aging effect as two parts: intra- and inter-age effects, which uses micro data from CHNS. Measuring the effects of aging in China from 1993 to 2009, the results show that the effects of aging in China mainly come from the effects of age, and the effects within age can be ignored (Liu Jindong et al., 2014). In addition to using micro data to study the effects of aging on income inequality, domestic scholars also use macro data to verify. For example, Dong Zhiqiang et al. (2012) used Chinese provincial panel data from 1996 to 2009 to use regression models to prove that aging affects China Income inequality has a significant positive impact. Lan Jiajun et al. (2014) empirically examined the effects of aging on income inequality significantly using transnational panel data, and Li Feiyue (2015) used 1982-2013 time series data to prove that population aging, whether from the country or within cities The perspective of whether it is rural or urban-rural contrast has a significant inverted U-shape effect on income inequality (Li Feiyue, 2015).

The above literatures have studied the impact of population aging on income inequality. There are relatively few domestic studies on the impact of population aging on urban-rural income gaps. For example, Ji Xiaoxu (2016) used China's 2002-2014 provincial panel data to confirm that house prices rose Aggravating the degree of aging will directly increase the income gap between urban and rural areas; Wang Xuxu et al. (2017) China ’s provincial panel data from 2000 to 2014 verified that the aging coefficient of urban and rural population has a significant positive effect on urban and rural income inequality. The literature on the impact of rural

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population aging on the urban-rural income gap is even less. This article will bridge this research gap.

2. MODEL SETTING, INDICATORS AND DATA DESCRIPTION

The explanatory variables in this article only include indicators for the aging of the rural population. The main factors affecting the income gap between urban and rural areas are placed in the control variables, while the remaining factors affecting the income gap between urban and rural areas are classified as residuals. In order to alleviate the heteroscedastic phenomenon, logarithms are taken for most variables. The empirical research model is as follows:

$$lnGap_{it}=\alpha+\beta Iold_{it}+\gamma_j\sum Z_{it}+\mu_i+\mu_t+\varepsilon_{it}$$

Among them, Gap_{it} is the degree of regional urban and rural income inequality, $Iold_{it}$ is the degree of aging of the rural population in the region, Z_{it} is a series of control variables that affect urban and rural income inequality, μ_i and μ_t represent individual effects and period effects, respectively. ε_{it} is a random perturbation term.

There are many factors that affect urban and rural income inequality. If too many key variables are placed in the random disturbance term, the regression results may be non-uniform, and if too many control variables are introduced, the multicollinearity problem may be exacerbated. Therefore, in order to control the impact of other variables, according to previous studies, this paper selected economic development level, human capital level, urban and rural fixed asset investment ratio, social welfare expenditure, economic opening level, industrial structure, urbanization and other indicators as the control variables, this can avoid the endogenous problems caused by missing variables to a certain extent.

The interpreted variable, urban-rural income inequality, is measured by the ratio of urban residents 'per capita disposable income to rural residents' per capita net income (Gap). The larger the ratio, the higher the urban-rural income inequality.

Explanatory variable-the aging of the rural population. This article uses the ratio of the population over 65 to the population under the age of 14 (Iold), that is, the ratio of the old-age dependency ratio to the child dependency ratio. This indicator can reflect the degree of aging.

Due to China's unique urban-rural dual economic structure, there is a clear expected income gap between urban and rural areas. According to Todaro's theory of population movement, as long as there is an expected income gap between urban and rural areas, rural labor will flow to the city; and the age of population migration is chosen The average age of the rural outflow population and the proportion of the elderly population are much lower than the overall level of the rural population (Zou Xiangjiang et al., 2013); and because the free movement of population between urban and rural areas has not been fully realized, those with higher education levels Those with higher knowledge and technical level may be accepted by the city, and the elderly population with low knowledge, technical level and relatively fragile psychology will return to the countryside (Zhao Hongjun, 2008). The internal “renewal” of floating population "As young migrants continue to replace older migrants, coupled with the return of the elderly, the age-selective nature of this migration has accelerated the aging of the rural population. The overall age structure of rural areas is aging, which has widened the gap with cities in terms of human capital levels and productivity.

Therefore, this article proposes the hypothesis: the aging of the rural population will exacerbate the income gap between urban and rural areas.

Control variables-(1) Social welfare expenditure. This article uses social welfare expenditure as a proportion of fiscal expenditure (Welfare) to measure. Before 2006, social welfare expenditures consisted of pension and social welfare relief expenses, social security subsidy expenditures, pension and social welfare relief expenses, and health expenditures. After 2007,

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they consisted of social security and employment expenditures and health expenditures. Social welfare expenditure is very important to alleviate the burden of urban and rural labor support, so it is necessary to use social welfare expenditure as a control variable that affects urban and rural income inequality. (2) The level of human capital. This article uses the average years of education (Hum) to measure. Human capital is an important way to improve income distribution. The higher the level of human capital, the higher the probability of obtaining a job in the urban non-agricultural industry, and the response to the industrial structure. The stronger the ability to challenge transformation and upgrading, the greater the opportunity to stay in the city and enjoy the benefits of the city. However, because the government's investment in education is urban-biased, the human capital content of urban residents is higher than that of rural residents due to the popularity of education. Therefore, the sign of this variable is expected to be positive (Cheng Li, 2014). (3) Urban-rural fixed asset investment ratio. This article uses urban fixed asset investment / farm household fixed asset investment (Invb) to measure. Because China has a long-term urban biased development strategy under a dual economic structure, capital accumulation in the industrial sector is mainly It is used for industrial reproduction, so the ratio of investment in fixed assets between urban and rural areas may increase income inequality between urban and rural areas. (4) The level of urbanization. This article uses the ratio of urban population to total population (Urban) to indicate that urbanization has both the role of expanding the urban-rural income gap and the role of reducing the urban-rural income gap. The symbols need to be given by empirical results. (5) Economic development level. This article uses real GDP per capita (Rgdp) (converted to 1990 constant price) to indicate that the income gap between urban and rural areas will first expand and then shrink as the economy develops. Therefore, this article is in the model. Add both the primary and square terms. (6) The degree of economic openness. This paper uses the ratio of total imports and exports to GDP (Open) to indicate that related research shows that economic opening up will reduce the income gap between urban and rural areas. (7) Industrial structure upgrade. This article uses the ratio of the output value of the tertiary industry to the secondary industry (Stsr) to measure. If the Stsr value is on the rise, it means that the industrial structure is upgrading and the economy is advancing towards service. The industrial structure upgrade may widen the urban-rural income gap, or narrow the urban-rural income gap, depending on the empirical results of this article.

This paper uses panel data of China's provinces for measurement inspection. Considering the availability of data, the sample size is 510 samples from 30 provinces in China from 2000 to 2017. Due to statistical restrictions, Hong Kong, Macau, Taiwan and Tibet are not included. The data sources are from the Statistical Yearbook, China Statistical Yearbook, China Population and Employment Statistical Yearbook, and China Rural Statistical Yearbook from 2001 to 2018. Table 1 shows descriptive statistics for each variable.

Table 1. Descriptive statistics of each variable

variable	Observations	Mean	Std. Dev.	Min	Max
lnGap	540	1.048561	0.1933703	0.6125599	1.84156
Iold	540	0.5481897	0.3143323	0.1386139	2.752412
lnRgdp	540	9.215744	0.721933	7.396631	10.93011
$InRgdp^2$	540	85.45016	13.31894	54.71015	119.4672
lnUrban	540	-0.7136939	0.3120224	-1.689738	-0.0479086
lnOpen	540	1.093445	1.179533	-0.8146177	4.715745
lnlnvb	540	3.40931	1.046365	1.307546	8.011536
Welfare	540	0.240337	0.2076607	0.0738046	1.105406
lnHum	540	2.126875	0.1258569	1.693474	2.538851
lnStsr	540	-0.1138756	0.3466391	-0.7044612	1.443779

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3. EMPIRICAL TEST AND RESULT ANALYSIS

The key to panel data regression is to choose a suitable regression method. This article mainly determines whether to choose a random effect or a fixed effect based on the Hausman test results (see Table 2). The Hausman test was used to compare the random effect model and the fixed effect model. In the end, this paper uses the fixed effect model as the base model for the static regression results (see Table 3).

It can be seen from Table 3 that the model has a good fitting degree and the estimation effect is ideal, which is consistent with the hypothesis in this paper. There is a clear positive correlation between the aging of the rural population and the income gap between urban and rural areas. Its coefficient value is 0.1279346, which is significant at a significance level of 1%, which indicates that the aging index of the rural population is increased by 1 while maintaining other variables unchanged. The average gap between urban and rural areas in China has expanded by 0.1279346%.

The results of the analysis of each control variable are as follows: (1) The estimated coefficient of social welfare expenditure (Welfare) is significantly negative, indicating that social welfare expenditure helps reduce the urban-rural income gap. (2) The estimated coefficient of human capital (Hum) is significantly positive, indicating that urban-oriented education investment will expand the urban-rural income gap. (3) The estimated coefficient of urban-rural fixed asset investment ratio (Invb) is positive, indicating that there is a significant difference in fixed-asset investment between urban and rural areas, which increases income inequality between urban and rural areas. (4) The urbanization level (Urban) estimation coefficient is significantly negative, indicating that urbanization helps to reduce the income gap between urban and rural areas. (5) The estimated coefficient of economic development level (RGDP) is significantly positive, while the estimated coefficient of quadratic term is significantly negative, indicating that with the improvement of economic development level, urban and rural income inequality has a significant inverted U-shaped characteristic. (6) The estimated coefficient of economic openness (Open) is significantly negative, indicating that economic openness helps to reduce the income gap between urban and rural areas. (7) The estimated coefficient of industrial structure upgrade (Stsr) is significantly negative, indicating that the industrial structure upgrade helps to reduce the income gap between urban and rural areas.

Table 2. Panel data model setting test results

Hausman test	
Hausman Statistics	31.44
P value	0.0002
result	Fixed effect model

4. CONCLUSIONS AND POLICY RECOMMENDATIONS

The large income gap between urban and rural areas is a major obstacle to the establishment of a well-off society in China. The aging of the rural population poses a new challenge to solving the inequality of urban and rural income. In this regard, based on China ’s 2000-2017 inter-provincial panel data, this paper explores the impact of rural population aging on urban-rural income inequality by constructing a panel data model of the effects of rural population aging on urban-rural income inequality. Conclusions and policy implications:

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Table 3. Model test results

variable	lnGap	
	FE	RE
Iold	0.1279346*** (0.0285378)	0.1065714 *** (0.0280515)
lnRgdp	0.3394261** (0.1372352)	0.4199458*** (0.1377475)
$InRgdp^2$	−.0246821*** (0.0075063)	−.0283661*** (0.0075444)
lnurban	−0.2369453*** (0.0308674)	−0.261477 *** (0.0300415)
lnopen	−0.0352028*** (0.0057793)	−0.0350944*** (0.0057695)
lnlnvb	0.3168888*** (0.1008883)	0.0432175*** (0.0107318)
welfare	−0.0422015** (0.0173295)	−0.042907** (0.0176093)
lnhum	0.3168888 *** (0.1008883)	0.2445702 ** (0.0976704)
lnstsr	−0.0974895 *** (0.020322)	−0.0810674 *** (0.0200053)
constant	−.9854312 (0.6376908)	−1.270754 ** (0.6383033)
N	540	540
Within	0.4268	0.4241
Between	0.4111	0.4686
Overall	0.4134	0.4566

Note: Standard errors are in parentheses. ***, ***, and * indicate that they passed 1%, 5%, and 10% hypothesis tests.

(1) The aging of the rural population is one of the important reasons for the widening of the urban-rural income gap, but the root cause is caused by the migration of urban and rural population under China's inherent urban-rural dual economic structure, so it is important to further break down the urban-rural dual economic system in China. significance. (2) For the rural floating population, we need to solve the problem of semi-urbanization and improve the degree of urbanization. As for those farmers who have already flowed into the cities, they cannot enjoy the same benefits as urban residents for their employment, child education and social security. As a result, they have been unable to integrate into the cities for a long time. China has formed a dynamic population flow situation in which the rural young population is constantly replacing the elderly population, significantly reducing the proportion of the rural young population and increasing the aging level of the rural population. The government should advance to solve the problem of semi-urbanization of rural floating population, gradually and gradually release the implementation of equal treatment of rural floating population and urban residents, and promote the integration of urbanization and urban-rural development. (3) Balance urban and rural education resources and improve rural human capital. The government needs to further increase investment in education in rural areas, especially in remote and poor rural areas, encourage more college students and young teachers to enter grassroots work, improve the quality of education and teaching in the region, and invest more advanced and modern education resources to shorten urban and rural areas. Education gap. (4) Increase social welfare expenditure and strengthen government intervention. In terms of fiscal expenditure, the government should increase rural employment security expenditures and medical and health expenditures. Through government intervention, the rural labor force's

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natural disadvantage in employment can be linked to a certain extent. (5) Improve the level of economic opening and industrial upgrading. Rural areas can enjoy the benefits of industrial radiation during the process of economic opening.

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