

Study on the Alleviation Effect of Urbanization on Rural Poverty

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Abstract. This paper builds a multi-layer linear model, using the 2016 China Family Panel Studies (CFPS) database and provincial macro data. The variables of urbanization level, financial development level, rural family size, family population burden coefficient and family average age were selected to test the poverty reduction effect of urbanization. The results showed that: from a macro perspective, The effect of urbanization on rural poverty is significantly negative, indicating that the improvement of urbanization level can effectively reduce rural poverty; the improvement of fiscal support for agriculture is also conducive to reducing rural poverty. From the perspective of rural families, the larger the family size, the greater the burden on the family population and the larger the average age of the family, Rural families are more likely to fall into poverty.

Introduction

Since the reform and opening up, China's urbanization process has made great achievements, the urbanization rate has increased from 17.92 in 1978 to 58.52% in 2017. In the process of urbanization in China, China's rural poverty reduction undertakings have also made significant achievements. The rural poverty rate has dropped from 30.7% in 1978 to 3.1%. Urbanization can promote the integration of urban and rural development, and thus promote the development of rural economy and the growth of farmers' income, thus achieving the coordinated development of urbanization and agricultural modernization. The development of cities and towns can attract farmers to move to cities. Farmers can have more employment opportunities in cities, thus increasing their wage income. The expansion of cities and towns will lead to the improvement of rural economic level, and farmers can have opportunities to engage in more non-agricultural operations, which is conducive to reducing rural poverty. Therefore, urbanization is an important way to solve the problem of agriculture, rural areas and farmers. The "National New Urbanization Plan (2014-2020)" puts forward the goal of urbanization development in China: by 2020, the urbanization rate of permanent residents will reach 60%, the urbanization pattern will be more optimized, the development model will be scientific and reasonable, the urban life will be harmonious and pleasant, and the institutional mechanism of urbanization has been continuously improved. The empirical test of the impact of urbanization on rural poverty is of great significance for revealing the poverty reduction effects and mechanisms of urbanization. Based on this, this paper empirically tests the impact of urbanization on rural poverty from the perspective of rural families.

Literature Review

Most of the previous studies focused on the relationship between urbanization and farmers' income and urban-rural income gap. In the process of urbanization, it can promote the accumulation and diffusion of production factors between urban and rural areas and between provinces, so it can promote the upgrading of industrial structure[1], and absorb more rural surplus labor into the city for employment[2], thereby promoting farmers' income growth and narrowing the urban-rural income gap, but the effect of urbanization on the gap between the rich and poor depends on the level of urbanization development, In the early stage of urbanization development, the urban-rural gap will be widened, while in the later period, the urban-rural gap will be narrowed[3]. However, in the process of urbanization, there will also be some challenges. For example, under the pattern of imbalance between urban and rural areas in China, unfair resource allocation such as finance,

taxation, price, education, etc. will lead to increased rural poverty and increasing urban-rural gap[4], Over-biased urban development policies can lead to imbalances in urban and rural development. Moreover, due to the existence of multiple division systems and the high cost of citizenization, it is difficult for migrant workers in cities to truly integrate into urban life[5], and employment is often at the low end of the urban industrial chain[6], its wage income is difficult to support high cost of living, thus restricting the growth of farmers' income. A large number of passive urbanization also makes farmers not really enjoy the basic public services of the city[7]. This passive urbanization will not only affect the quality of urbanization, social equity and market efficiency, but also affect the modernization of agricultural and rural development.

In recent years, some scholars have studied the relationship between urbanization and poverty. Shahbaz and Aamir et al.(2010)studied the poverty alleviation effect of urbanization in Pakistan and found that the mitigating effect of urbanization on poverty in the short term is more obvious than in the long run[8]. Li and Yang(2014) conducted a study on the poverty reduction effect of urbanization by constructing a provincial panel model. The study found that with the improvement of urbanization level, the rural poverty rate will decline[9]. Wang and Liu(2018) empirically tested the poverty reduction effect of urbanization by constructing a dynamic panel model and found that the poverty reduction effect of urbanization is mainly reflected in the slowdown of the breadth and depth of rural poverty[10]. Cui and He(2018)used the data from 2000 to 2014 in 25 provinces of China to empirically test the impact of urbanization on rural poverty. The results show that urbanization has a U-shaped structure for rural poverty alleviation, And the income effect of urbanization on rural poverty alleviation is greater than its transfer effect[11]. There are also some studies that analyze the new urbanization and anti-poverty issues in ethnic areas[12].

Through literature review, it can be found that the research on the effect of urbanization on rural poverty is still very limited, especially from the perspective of rural household poverty. Based on this, this paper uses a multi-layer linear model to empirically test the effect of urbanization on poverty reduction from the perspective of rural families.

Model Building

In many fields of research, hierarchical data structures are involved. For example, in the study of educational problems, there will be a multi-level data structure. The first level unit is the individual student, and the student is subordinate to the the class. The class is subservient to the school. In this study, rural household poverty variables belong to the first-level unit data, rural households are subordinate to townships, townships are subordinate to counties and cities, and counties and cities are subordinate to provinces and regions. Because in order to protect the data information of the surveyed farmers and related units. So the CFPS database does not disclose county-level data. Therefore, in this study, the first level unit is rural household data, the second level unit is provincial macro data.

In the traditional linear model, the basic assumptions are linearity, normality, homogeneity of variance and mutual independence. However, in the hierarchical linear model, the assumptions of homogeneity and independence of variance are often unsuccessful, because the second-level unit data of individuals in the same group will be very close or similar, so in the sample data, the sample data of different groups may be independent, but the sample data in the same group may have very similar values. In dealing with this kind of hierarchical data, if the traditional linear regression model is used, the error of parameter estimation will increase. Therefore, we need to use the hierarchical linear model, also called the multilayer linear model (HLM). The basic expression for the hierarchical model is as follows:

$$y_{ij} = \beta_{0j} + \beta_{1j}x_{ij} + \varepsilon_{ij} \quad (1)$$

$$\beta_{0j} = \gamma_{00} + \gamma_{01}k_{1j} + u_{0j} \quad (2)$$

$$\beta_{1j} = \gamma_{10} + \gamma_{11}k_{1j} + u_{1j} \quad (3)$$

In the formula, γ_{00} and γ_{10} represent the average value of β_{0j} and β_{1j} , It is equivalent to a fixed intercept. u_{0j} and u_{1j} represent the random part of β_{0j} and β_{1j} . They represent the variability between data at the provincial level. γ_{10} represents the regression parameter effect of rural family characteristic variables. γ_{01} represents the effect of provincial macro level data regression parameters. γ_{11} represents the random slope portion of the model.

Variable Selection

The rural household level data in this paper is derived from the 2016 CFPS (China Family Tracking Survey) database. The CFPS database is a follow-up survey conducted by the China Social Science Research Center (ISSS) of Peking University. It mainly collects data on urban and rural families, individuals and communities. Its purpose is to reflect the development and changes in China's economy, society and population. The CFPS survey project was initially conducted in Beijing, Shanghai, and Guangdong. The official survey was started in 2010. The sample includes 25 provinces in China (excluding Inner Mongolia, Hainan, Tibet, Qinghai, Ningxia, Xinjiang Hong Kong, Macao and Taiwan regions), the survey includes children, adults, families and communities. The baseline family members determined from 2010 will be the gene members of the database and will be permanently tracked. The CFPS database includes a children's database, an adult database, a home database, and a community database to collect sample data in all directions. Currently, CFPS has conducted a four-year follow-up survey in 2010, 2012, 2014, and 2016. The sample data for this study is the 2016 survey data. In 2016, there were 14033 samples in the family database, 8465 samples in the children database, and 33296 samples in the adult database. The authors merged the 2016 household database, the children database, and the adult database. Then, by matching provincial macro data and excluding urban data and missing values, 6564 rural household samples studied in this chapter are finally determined.

This paper uses a multi-layer linear model to test the impact of urbanization levels on rural poverty, so the sample data is also divided into two-tier structure, rural household level and provincial macro level. The selection and descriptive analysis of variables are shown in Table 1:

Table 1 Selection and descriptive analysis of variables

category	variable	Variable definitions	average value	Expected direction
Dependent variable	Pov	The poverty value is 1, Non-poverty assignment is 0	0.1509	
Rural household variable	POP	Family size	4.0618	Positive
	FUD	Family population burden	0.3684	Positive
	AGE	Average family age	42.231	Positive
Provincial macro variable	LAR	Household labor ratio	0.7999	Negative
	URB	Urbanization rate	0.5479	Negative
	CZ	Financial support for agriculture	0.3598	Negative
	FIR	Financial level	3.3609	Negative

The explanatory variable is the rural household poverty variable. According to the 2010 national standard 2300 yuan poverty line standard, the rural household poverty variable is calculated. The explanatory variable is the binary variable, that is, the per capita annual income of rural households is lower than the poverty standard value of 1, otherwise the value is 0. The explanatory variables at the rural household level include: family size, family population burden, average age of family members, and the proportion of family labor, the variables at the provincial macro level include: urbanization level, Financial support for agriculture, financial development level.

The family size is the total number of households in 2016 in the CFPS database, the expected direction is positive, that is, the more families there are, the more likely they are to fall into poverty. The family population burden coefficient is the ratio of the number of non-labor population to the number of labor force in rural households, the ratio is to reflect the burden factor of the family labor force, the expected direction is positive, that is, the greater the burden factor of the family labor force, the more likely the rural families are trapped in poverty. The average age of family members is the average age of all members of the family, and the expected direction is positive, that is, the greater the average age of the family, the more likely to fall into poverty. The proportion of household labor is the proportion of the household labor force to the total population, the expected direction is negative, that is, the smaller the proportion of rural household labor, the more easily rural households fall into poverty. The level of urbanization is the proportion of urban permanent residents to the total population, that is, the population urbanization rate, and the expected direction is negative, that is, the improvement of urbanization level is conducive to reducing rural poverty; The level of financial support for agriculture is the ratio of fiscal expenditure to agricultural output and the total output value of the primary industry. The expected direction is negative, that is, the increase in the level of financial support for agriculture can reduce rural poverty; The level of financial development is expressed by the ratio of total deposits and loans of financial institutions in various regions to the regional GDP, the expected direction is negative, that is, the improvement of financial level is conducive to alleviating rural poverty. The provincial macro data comes from the China Statistical Yearbook, the China Economic and Social Big Data Research Platform and the regional statistical yearbooks.

Empirical Analysis

Since the rural poverty variable studied in this paper is a binary variable, the model adopted is a binary selection model and a binary multi-level linear model to test the effect of urbanization development on rural poverty. The empirical results are shown in Table 2.

Table 2 Empirical test results

Variable	Logit model		Hierarchical linear model	
	Coefficient	P value	Coefficient	P value
POP	0.155*** (0.0198)	0.000	0.140*** (0.0202)	0.000
FUD	0.431** (0.175)	0.014	0.317* (0.178)	0.075
AGE	0.0496*** (0.00364)	0.000	0.0490*** (0.00365)	0.000
LAR	-1.351*** (0.521)	0.009	-1.540*** (0.526)	0.003
URB	-2.961*** (0.435)	0.000	-3.507*** (1.131)	0.002
CZ	-0.672*** (0.232)	0.004	-0.669* (0.352)	0.058
FIR	0.152*** (0.0535)	0.005	0.264 (0.161)	0.100
Constant	-2.331*** (0.531)	0.000	-2.199** (0.896)	0.014
Observations	6564		6564	
Log-likelihood	-2628.3473		-2610.7322	

The core explanatory variable is urbanization level, and Control variables include family size (POP), family population burden (FUD), average family age (AGE), household labor ratio (LAR),

financial support for agriculture (CZ), and financial development level (FIR). As can be seen from table 2, in the two models, the coefficients of urbanization level are -2.961 and -3.507, and are significant at 1% level, indicating that the improvement of urbanization level is indeed effective in reducing rural poverty, consistent with expected assumptions. The coefficient of financial support for agriculture is -0.672 and -0.669, and are significant at the 10% level, indicating that the increase in fiscal support for agriculture is conducive to rural poverty reduction, in line with expectations. The coefficients of financial development level are 0.152 and 0.264, but they are not significant in the multi-level model, indicating that the impact of financial level development on rural poverty is not significant. The coefficient of rural household size is 0.155 and 0.140, and are significant at the 1% level, indicating that the more rural households, the more likely they are to fall into poverty, in line with expectations. The coefficient of family population burden is 0.431 and 0.317, and are significant at the 10% level, indicating that the greater the rural household population burden coefficient, the more likely they are to fall into poverty, in line with the expected assumptions. The average age of family members is 0.0496 and 0.0490, and are significant at the 1% level, indicating that the larger the average age of rural households, the more likely it is to lead to poverty, in line with expectations. The coefficient of household labor ratio is -1.351 and -3.707, respectively, and are significant at the 1% level, indicating that the greater the proportion of rural household labor can effectively reduce rural poverty.

Conclusions

Using CFPS database and provincial macro data, this paper selects the variables of urbanization level, financial support for agriculture, financial development level, rural family size, family population burden coefficient and family average age, and adopts multi-layer linear model to develop urbanization level. The multi-layer linear model is used to empirically test the impact of urbanization level development on rural poverty. The result shows that the impact of urbanization on rural poverty is significantly negative, indicating that the improvement of urbanization can effectively reduce rural poverty. The improvement of financial support for agriculture is also conducive to reducing rural poverty; The impact of financial level development on rural poverty is not significant, indicating that Financial development has not yet benefited poor areas and poor people. The coefficient of rural family size, family population burden and family average age are positive, indicating that the larger the family size, the greater the family population burden and the larger the average family age, the more likely rural families are to fall into poverty. The proportion of rural household labor to poverty is significantly negative, indicating that the greater the proportion of rural household labor, the less likely it is to fall into poverty.

China's urbanization development is still unbalanced in terms of spatial layout. The gap between the eastern, central and western regions is still very large. It is necessary to further optimize the spatial layout of urbanization development and better play the role of urbanization in reducing poverty. Financial support for agriculture also has a significant mitigating effect on rural poverty. Therefore, we must give play to the guiding role of fiscal support for agriculture and give play to the poverty reduction effect of fiscal support for agriculture. It can be seen from the test results of the multi-layer model that the development of financial level has no significant impact on rural poverty. Therefore, it is necessary to further develop inclusive finance so that poor and poor people can enjoy the dividend of financial industry development, thus slowing down rural areas. poor. Accelerate the development of urban and rural integration to promote rural economic development and increase farmers' income, thereby reducing rural poverty. Further improve the policy system for the urbanization of migrant workers in cities, so that the agricultural transfer population can enjoy the same treatment as urban residents in education and medical care.

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