Labor Migration Effects on Alleviating Poverty for Rural Household: Empirical Evidence from China

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Abstract: *This paper takes data from 31 provinces in China for 1986～2017 years as a sample, building a dynamic panel model and using systematic GMM estimation method to research the effect and mechanism of labor mobility on poverty alleviation. The results showed that poverty in the early stage had a significant impact on poverty in the current stage, and poverty had a significant time additive effect; There exists a negative dependence between labor mobility and poverty, labor flow does contribute significantly to poverty alleviation; Labor mobility indirectly promoted poverty reduction through two paths of income gap and agricultural development; The result of moderating effect shows that the improvement of transportation condition, industrial agglomeration is conducive to bring into play of poverty reduction of labor fluxion; From regional perspective, labor flow in the central region has the greatest poverty decreasing effect, the smallest in the eastern region. For that, we present some recommendations about decreasing poverty, such as reasonably guiding labor mobility, keeping away the recurrence and reproducibility of poverty and accelerating the melioration of traffic installation condition.*

Keywords: Labor Mobility; Poverty reduction; Dynamic panel model; Intermediary effect method.

1. Introduction

Since the reform and opening up, China's economy has achieved rapid development, the living conditions of urban and rural residents have steadily improved, and the rural economic situation has been completely new. However, while seeing these achievements, we should also see that the current gap between urban and rural areas in China has a widening trend, urban and rural development imbalance is prominent, rural poverty problem is still more serious, by the end of 2018, the number of rural poverty in China is still 16.6 million people. In recent years, China has stepped up efforts to alleviate poverty and taken a number of measures to do a good job in poverty alleviation, and the 19th National Congress report emphasized the determination to fight poverty, which underscores the urgency and importance of poverty alleviation in the new era. Therefore, in the new period, poverty eradication is an important problem and key task for China's economic development. With China's economic transformation and the development of new urbanization, more and more rural labor force into urban employment, which has become a common economic phenomenon in China. The size of China's labor mobility has doubled from 121 million in 2008 to 244 million in 2017. This not only changes the income structure of rural families in China and the allocation of resources between regions, improves the income level of farmers, but also promotes China's economic development and restrains the widening income gap (Li, 1999), has a far-reaching impact on China's social and economic development. Data show that from2008 to 2017, the average monthly income of migrant workers out of the country was 1340 Increased to RMB 3805, up 183.96% .It could be seen that it is practical to promote poverty alleviation through labor mobility.

On the impact of labor mobility on poverty alleviation, two main views have been formed in domestic and foreign academic circles: the favorable and negative theory of labor mobility to poverty alleviation.

The advantage. Richard and Page (2005) study found that international migration significantly reduced the extent, depth and severity of poverty in developing countries. McKenzie and Rapoport (2006) examined empirical

evidence of the inversion of migration and inequality in rural communities in Mexico and found that the overall impact of migration was to reduce inequality in the community. The Sabates-Wheeler et al. (2008) study found that labor migration has a significant positive impact on poverty and can effectively improve people's lives. According to studies in Ecuador, Bertoli and Marchetta (2014) have found that migration flows will contribute to a reduction in household poverty rates by 17.4 to 20.8 per cent. Nguyen et al. (2011) believes that both job and non-work migration have a positive impact on the per capita expenditure of migrant families, which significantly reduces the incidence, depth and severity of poverty in the country, while reducing inequality to varying degrees. Yue and Luo (2010) through the rural survey data, think that labor mobility can significantly reduce rural poverty. Pu (2011) based on the survey sample data, the results of the study show that rural labor mobility is conducive to promoting the improvement of rural poverty. Fan and Jiang (2016) found that labor mobility is beneficial to improving household income and reducing poverty. Elena et al. (2018) assessed the relationship between U.S. immigration policy and the socio-economic stratification of immigrants, combining data from the 2014 U.S. Community Survey with a measure of the extent to which the national immigration policy was included, and found that states with more inclusive immigration policies may create an environment. Promote the well-being of the local economy. Sigad et al. (2018) analyzed the interaction between work, migration and poverty among Israeli working migrants, and found that migrant swork and life are of vital importance in poverty. He and Cui (2018) used panel data to conduct empirical studies and found that rural labor transfer is conducive to the reduction of poverty. Liu (2018) believes that labor mobility can effectively improve rural poverty and promote poverty alleviation by reducing income disparities.

The disadvantage. Using household data and using the rural migration network as a tool, Dua et al. (2005) found that migration increased the per capita income of households by 8.5 to 13.1 per cent, but the overall impact on poverty was modest. Hansung et al. (2014) explores the economic situation of female female immigrants in Korea, and studies that, regardless of employment status, female marriage migrants in rural areas are at greater risk of poverty than urban migrants. Jia et al. (2017) believes that a significant number of people still live in poverty in rural areas and that labour migration has had a reduced impact on poverty reduction. Qian and Zheng (2011) based on a survey sample, the results show that labor mobility will reduce household income. Based on micro-panel data, the results obtained by Li (2014) show that labor migration has no significant impact on poverty reduction. Zhao and Cheng (2016) based on the findings of hubei province survey data, and believe that the current labor outflow is not conducive to rural poverty reduction.

Through sorting out, this paper finds that there have been a lot of studies on this issue, and most of them believe that labor mobility is conducive to poverty alleviation. The existing researches discuss the poverty alleviation effect of labor mobility from different angles, which provides a good enlightenment for this paper. However, there are still some deficiencies in these studies. Firstly, poverty often has the effect of time accumulation and persistence, and the influence of poverty in the early stage on poverty in the current period is rarely considered by scholars in current studies, which will lead to inconsistent estimation parameters (Shan,2012) ,and incomplete estimation results. Secondly, although existing researches systematically analyze the mechanism of labor mobility and poverty in the theoretical part, few scholars make theoretical analysis more convincing by empirically testing its mechanism. Thirdly, the sample size selected is relatively small when using panel data for research.

Based on this, the problem to be solved by this paper: based on the perspective of narrowing income gap and agricultural development, using the data from 1986-2017 in various provinces of China as a sample, using dynamic panel model to analyze the effect and mechanism of rural labor mobility on poverty, and constructing "labor force-income gap-poverty" / "labor force-agricultural development-poverty" The new analytical framework specifically analyses how labor mobility plays a role in poverty and whether there are regional differences in the poverty reduction effects of labor mobility.

2. Theoretical Analysis and Hypothesis

That the impact of labor mobility on poverty has a direct and indirect impact, direct impact: workers from the agricultural sector to the non-agricultural sector, in the more developed industrial sectors can obtain higher wage income, while the migrant workers can also be due to higher income levels, Improving their standard of living and health, working in more developed sectors, can also lead to increased knowledge, and the transfer of wage income in the form of remittances to rural areas or their own return to rural areas can improve the living conditions of family members and increase their investment in agricultural production(Wang & Cai,2006), Promoting the improvement of the operating income of family agriculture is conducive to the sustainable relief of individual workers and families and the ability to improve their living standards. Combined with the above analysis, this

paper gives the first hypothesis:

Hypothesis 1: Labor mobility has a direct impact on poverty, it can directly and effectively promote poverty reduction. Labour mobility not only directly affects poverty, but also through two ways: income inequality and agricultural development.

First of all, the analysis of the labor mobility-income gap-poverty path, the impact of labor on income gap in two aspects: First, the labor force in the agricultural sector in the past showed low labor productivity, and the flow to non-agricultural industries can improve the marginal productivity of rural labor force, And gradually narrow the difference between the marginal productivity of the rural labor force(Yu & Zheng,2014), increase the wage income of the rural labor force, promote the convergence of urban and rural income; In addition, the outflow of labor will reduce the supply of agricultural products, force the price of agricultural products, increase the income of farmers' agricultural operations, thus making the income gap between urban and rural areas tend to converge; From a deep-seated point of view, the reason for the widening income gap between urban and rural areas in China lies in the obvious gap between urban and rural human capital (Li & Li , 2005); Labor mobility is represented by an investment in human capital (Wang & Cai , 2006) , the flow of labor to non-agricultural sector work, in the course of work, because the "dry secondary school" effect can accumulate more work experience for workers, from work experience to new knowledge, for the rural labor force is the accumulation of human capital, It is beneficial to promote the improvement of the level of human capital, promote the convergence of human capital level in urban and rural areas, and then make the income gap between urban and rural areas gradually converge and narrow the gap, while the change of poverty is affected not only by the average income level, but also by the urban-rural income gap (Luo ,2012), and thus the urban-rural income gap narrows. It is conducive to the reduction of relative poverty. Thus, this paper gives the second hypothesis of empirical research:

Hypothesis 2: Labor mobility can indirectly affect poverty through the income gap path.

Next, the role path of "labor mobility - agricultural development - poverty" is analyzed. The impact on agricultural development is mainly manifested in four aspects: First, it can alleviate the tension of cultivated land in rural areas, and at the same time alleviate the situation of "over-tightening" and "internal roll-up" of agriculture, and improve the marginal output of agricultural production; Third, the outflow of labor will reduce the labor resources of the agricultural sector, cause the price of agricultural labor, further promote the promotion and use of agricultural mechanization, conducive to the improvement of agricultural productivity, promote agricultural income; This country has more financial resources to support agricultural development. The development of agriculture (Wei, Zhang, & Gao, 2017; Cheng, Huang, & Liu, 2015), on the other hand, can increase farmers' agricultural operating income and promote poverty reduction. Based on the above analysis, this paper gives a third hypothesis:

Hypothesis 3: Labor mobility can indirectly affect poverty through the path of agricultural development.

In order to investigate whether the poverty reduction effect of labor mobility is affected by other factors, this paper analyzes the effect of thrust (traffic conditions) and pull (industrial agglomeration) to reflect the adjustment effect of labor mobility.

As an important factor of production, the improvement of transportation conditions can effectively reduce the transport costs and the flow costs of factors, and because changes in transport conditions affect the movement of labor between urban and rural areas by affecting workers' real wage income and immigration costs. The movement of labor between urban and rural areas will further affect the real wage income of the labor force, which accumulates and ultimately determines the spatial mobility of labor between urban and rural areas (Ren & Zhang, 2012).

The adjustment effect of industrial agglomeration on the poverty reduction effect of labor mobility is manifested in three aspects: First, the concentration of industry to a certain scale will produce a scale effect, which will increase the demand for labor, and the wage level will be raised accordingly, which can attract more labor to the region: second, The spillover effect of industrial agglomeration can promote technological innovation in the region, which increases the demand for high-quality talents and further expands the region's attractiveness to the workforce (Fan ,2004). Therefore, this paper gives a fourth hypothesis:

Hypothesis 4: The poverty reduction effect of labour mobility is affected by transport infrastructure and industrial concentration.

3. Research and Design

3.1 Model Construction

According to the theoretical analysis of the second part, this paper uses dynamic panel model, the lag period of poverty into the model, taking into account the time lag effect of poverty, and constructing the following model to empirically test the effect of labor mobility on poverty:

3.1.1 The Direct Effect of Labor Mobility on Poverty.

$$lnpoverty_{it} = \alpha + \rho_1 \ln poverty_{i,t-1} + \beta_1 lnlabor_{it} + \beta_2 M_{it} + \mu_i + \varepsilon_{it} \tag{1}$$

3.1.2 Effect Mechanism Test

In the theoretical part of this paper, it has been pointed out that labor mobility not only has a direct effect on poverty, but also may affect poverty through income gap and agricultural development. In this paper, we draw on the intermediary effect method of Wen Z.L (2014) to analyze the indirect effect of labor mobility on poverty, the intermediary effect should be tested three, the first test model has been given above, and the latter two test models are constructed.

$$lngap_{it} = \alpha + \rho_1 lngap_{i,t-1} + \beta_1 lnlabor_{it} + \beta_2 M_{it} + \mu_i + \varepsilon_{it} \tag{2}$$

$$lnagri_{it} = \alpha + \rho_1 lnagri_{i,t-1} + \beta_1 lnlabor_{it} + \beta_2 M_{it} + \mu_i + \varepsilon_{it} \tag{3}$$

$$lnpoverty_{it} = \alpha + \rho_1 lnpoverty_{t-1} + \beta_1 lnlabor_{it} + \beta_2 lngap_{it} + \beta_3 M_{it} + \mu_i + \varepsilon_{it} \tag{4}$$

$$lnpoverty_{it} = \alpha + \rho_1 lnpoverty_{t-1} + \beta_1 lnlabor_{it} + \beta_2 lnagri_{it} + \beta_3 M_{it} + \mu_i + \varepsilon_{it} \tag{5}$$

Among them, model (2) and model (3) study the effect of labor mobility (3) on intermediary variables, model (4) and model (5) based on model (1), including intermediary variables - income gap, agricultural development, to study the extent of the impact of intermediary variables on poverty, and in the case of model (2) and model (3) is established to make sense.

3.1.3 Regulatory Effect.

In order to test whether the influence of labor mobility on poverty is affected by transportation infrastructure and industrial agglomeration, this paper included the cross term of traffic conditions, industrial agglomeration and labor mobility, the regulating variable, into equation (1) to verify whether the regulating effect exists. Therefore, this paper establishes the following empirical test model:

$$lnpoverty_{it} = \alpha + \rho_1 lnpoverty_{t-1} + \beta_1 lntralab_{it} + \beta_2 M_{it} + \mu_i + \varepsilon_{it} \tag{6}$$

$$lnpoverty_{it} = \alpha + \rho_1 lnpoverty_{t-1} + \beta_1 ln agglab_{it} + \beta_2 M_{it} + \mu_i + \varepsilon_{it} \tag{7}$$

Where, is province, is year, is poverty rate, is labor flow, is fixed individual effect, is error term, is control variable set, model (1) selects traffic conditions, urbanization, financial development, industrial structure, and medical conditions as control variables. In model (2), we select urbanization, economic growth, economic openness, human capital, as the control variables; In model (3), we select farmland input, agricultural capital input and agricultural practitioners as control variables. The control variables of model (4) and model (5) are the same as those of model (1). The existence of regulatory effects in models (6) and (7) requires only the existence of significant correlation between cross-terms and dependent variables.

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3.2 Variable Description

The data used in this article is panel data for 31 provinces in China from 1986 to 2017, and 1986 was chosen as the starting year, because the country began to carry out poverty alleviation work in that year , so the sample selected in this paper is data from all provinces in mainland China from 1986 to 2017, and the data are derived from the China Statistical Yearbook and the Statistical Yearbook of each province.

In order to better carry out the empirical test, the selection of variables is explained below, in which the variables - agricultural development, income gap, agricultural capital investment, openness, economic growth, industrial structure of the measurement index are adjusted against the 1986 price index 100.

3.2.1 Key Variables

Poverty rate: Poverty rate is the core factor variable of this paper, this paper refers to Shi R.R. (2013) , Zhang and Weng (2015) , the use of rural residents Engel coefficient as a measure of rural poverty, Engel coefficient is an internationally recognized measure of the family living standard of an important indicator. Labor mobility: Labor mobility is the core variable of this paper, rural labor mobility reflects the process and trend of labor movement from the agricultural sector to the second and third industries, considering that the current rural labor force in China although a large number of outward flow, but not out of the original household registration, more labor force has not long-term settlement of the city, Income is mainly taken home, they will also return to their original place of residence, the economy and the household registration of the integration , so this part of the mobile labor force is still mostly counted by rural working labor, so this paper uses rural workers minus the number of rural agricultural workers to obtain rural labor mobility, The indicator, which reflects the process of migration from the agricultural sector to the non-agricultural sector and changes in the labor force, is reasonably justified, and on the basis of which the ratio of the number of people in labor to the number of rural workers is used as a measure of labor mobility, with the aim of more visually reflecting the extent of annual labor mobility. Income Gap: Income Gap is the intermediary variable of this paper, and the ratio of per capita income between urban and rural areas is chosen as a measure of income gap. Agricultural development: Agricultural development is the intermediary variable of this paper, agriculture has the concept of size, the concept of agriculture, forestry, animal husbandry and fisheries, small concept only refers to agriculture, and this paper uses the general concept of the total agricultural output value as an indicator of agricultural development.

3.2.2 Adjust the Variable

Traffic conditions: Traffic conditions are the adjustment variables of this paper, and the highway mileage of the provinces is used as a measure of traffic conditions. Industrial Agglomeration Index: Industrial Agglomeration Index: Industrial Agglomeration is the adjustment variable of this paper, this paper draws on the methods of Liu and Xu (2010), which are calculated by the location entropy method, which is a common method to measure the degree of industrial agglomeration, and its formula is as follows:

$$Agglo = (M_{it}/M_t)/(P_{it}/P_t) \qquad (8)$$

3.2.3 Control Variables

Urbanization: Urbanization can reduce the income gap between urban and rural areas by raising the level of human capital in rural areas (Gao & Zhang , 2016) , and urbanization can promote the narrowing of the income gap between urban and rural areas by optimizing industrial structure and improving the health of the population (Ma & Wang , 2018), thus promoting the promotion and development of urbanization, and promoting the reduction of poverty. This paper measures the ratio of the number of towns to the total population. Human capital: From a deep-seated point of view, the reason for the widening income gap between urban and rural areas is that there is a clear gap between urban and rural human capital (Li & Li ,2005), so we should focus on improving the level of human capital in rural areas (Guo , 2005). The average number of years of education here is considered to be determined by the method of the number of years of education, the educational level is set to illiterate or semi-literate, primary school, junior high school, high school, university and above five levels, and set to 1, 6, 9, 12 and 16 years of five coefficients (Sun , 2009). The human capital calculation formula is as follows:

$$human = n \times \left(\frac{\sum\limits_{i=1}^{5} P_i \times E_i}{\sum\limits_{i=1}^{5} P_i} \right) \qquad (9)$$

Human is human capital, n is the total number of people employed in the society, Pi is the number of people with different educational levels, and Ei is the coefficient of years of each educational level. Economic openness : the improvement of economic openness, can promote the development of export trade, attract more foreign direct investment, increase employment and improve people's income (Mao , 2011), but closely associated with the degree of economic openness and economic developed, the more the economy developed area the higher the growingly opened, thus favorable open economy is relatively developed areas, regional development gap is widening, the income gap between urban and rural areas will expand accordingly, in this paper, with the provinces to measure total trade volume. Traffic condition: traffic condition is the regulating variable of this paper, and the mileage of highway in each province is used as the measurement index of traffic condition in this paper. Economic growth: economic growth can indeed improve residents' income, but without the improvement of relevant income distribution system, the "polarization effect" of economic growth will only widen the income gap. In this paper, the per capita gross output value of provinces is adopted as the measurement index of economic growth. Industrial structure: industrial structure can effectively promote poverty alleviation, and the tertiary industry has the most significant effect on rural poverty reduction. According to the experience of Gan (2011), this paper takes the ratio between the total value of the tertiary industry and the total value of the secondary industry as the measurement index of the industrial structure. Financial development: financial development can help promote poverty alleviation, rapid financial development can make poor residents enjoy preferential loan amount and financial services, and residents' living standard can help alleviate poverty. This paper chooses the ratio of deposit and loan of each province as the indicator to measure financial development. Medical conditions: the improvement of medical conditions can reduce the medical burden of residents, thus contributing to the improvement of living conditions. In this paper, the number of beds in health institutions in various provinces is used as an indicator to measure medical conditions. Cultivated land input: land is an important factor of agricultural development. This paper selects the agricultural cultivated land area of each province as the index of cultivated land input. Agricultural capital input: agricultural development cannot be separated from capital input. This paper selects the financial support agricultural expenditure of each province as the index to measure agricultural capital input. Practitioners: practitioners are essential to the development of agriculture. This paper measures the number of agricultural practitioners in each province.

In this paper, the original data are evaluated first, in order to eliminate the heteroquies, to ensure that the data will not have a large abnormal fluctuations, the descriptive statistics after the processing of each variable can be found in Table 1.

Table 1: Descriptive statistics of variables

Variables	define	observations	mean	Std. Dev.	Min	Max
lnpoverty	Poverty rate	992	3.862	0.246	3.208	4.453
lnlabor	Labor flow	992	3.414	0.587	1.384	4.468
lngap	Income gap	992	3.049	0.277	2.184	3.466
lnagri	Agricultural development	992	5.212	1.264	2.079	7.759
lntralab	intersection of Traffic and labor mobility	992	14.259	1.224	11.261	16.802
lnaglab	Industrial Agglomeration and labor force flow	992	8.597	0.387	7.478	9.380
lnpergdp	Economic growth	992	8.202	1.021	6.147	10.702
lnindustry	industrial structure	992	4.106	0.401	3.387	5.746
lnfinance	Financial development	992	4.474	0.321	3.148	5.340
lntraffic	Traffic conditions	992	10.845	0.969	7.671	12.692
lnurban	urbanization	992	3.557	0.519	2.319	4.495
lnhuman	Human capital	992	9.367	1.028	5.456	11.037
lnopen	Economic openness	992	7.462	1.684	2.481	12.113
lnfunding	funding input	992	11.255	0.846	8.458	12.727
lnplough	Farmland input	992	8.110	1.107	5.013	9.598
lnemploy	Agricultural practitioners	992	6.897	1.087	4.491	8.552

Source: processed according to stata software.

4. Empirical Analysis

This paper uses stata15.0 for empirical analysis and testing.
4.1 Stability Test

In order to ensure the reliability of model estimation, it is necessary to first examine the stability of each sequence data. The stability of the test sequence is mainly to see if it has a unit root, so the stability test is mainly based on unit root test. The use of LLC, ADF two methods for testing, in which ADF is a heteroroot test (i.e. the original hypothesis: heterogeneous panel data), and LLC is the same root test (i.e. the original hypothesis: homogeneous panel data), the specific test results are shown in Table 2. As can be seen from Table 2, for the original hypothesis, all variables are rejected, indicating that all sequences are stable and subsequent related studies can be carried out.

Table 2: Panel stability test

Variables	test ways(D,T,k)/ (C,D,k)	LLC test	ADF test	conclusion
lnpoverty	(D,T,1)/(C,D,1)	-4.984***	175.040***	steady
lnlabor	(C,T,1)/(C,D,1)	-3.231***	165.887***	steady
lngap	(C,T,1)/(C,D,1)	-2.552***	212.518***	steady
lnagri	(C,T,1)/(C,D,1)	-1.956**	172.234***	steady
lntralab	(C,T,3)/(C,D,1)	-3.326**	145.029***	steady
lnagglab	(C,T,1)/(C,D,1)	-2.642***	149.078***	steady
lntraffic	(C,T,1)/(C,D,1)	-1.934**	160.949***	steady
lnindustry	(C,T,0)/(C,D,1)	-3.076***	178.470***	steady
lnfinance	(C,T,0)/(C,D,1)	-1.752**	205.874***	steady
lnurban	(C,T,1)/(C,D,1)	-1.864**	148.222***	steady
lnhuman	(C,T,1)/(C,D,1)	-3.553**	120.975***	steady
lnopen	(C,T,2)/(C,D,1)	-4.847***	222.069***	steady
lnpergdp	(C,T,0)/(C,D,1)	-2.430***	173.387***	steady
lnfunding	(C,T,1)/(C,D,1)	-5.010***	222.083***	steady
lnplough	(C,T,1)/(C,D,1)	-2.803***	138.414***	steady
lnemploy	(C,T, 0)/(C,D,1)	-1.685**	172.188***	steady

Note: ***, ** and * respectively represent significance levels of 1%, 5% and 10% ; (C, T, k), (C, D, k) are LLC, ADF inspection methods, where C represents constant sympathising, T represents time trend item, k represents the lag period, d represents drift item.

4.2 Total Sample Estimate

According to the above tests, all data are stable, thus indicating that the model can be estimated accordingly, and the regression results obtained using the systematic estimation method are shown in tables 3 and 4. Table 3 is an estimate of direct effects and indirect effects, and Table 7 is an estimate of the regulatory effect. Tables 3 and 4 show that all seven model experiments have passed the 1% significance test, indicating that the overall linear relationship of the model is significant, the model does not reject the original assumption that is not second-order self-correlation, the over-recognition test accepts the original hypothesis, indicates that the tool variable is valid, and the model estimate is reasonable.

As can be seen from model 1, the lag period of poverty has a significant impact on current poverty, indicating that poverty has significant time accumulation and sustained effect, indicating that poverty alleviation is a long-term task, and poverty alleviation must be done well on a continuous basis; It shows that labour mobility does have an effective catalytic effect on poverty reduction, and that labour mobility can effectively contribute to the reduction of poverty, so the hypothesis 1 test is passed. In terms of control variables, traffic conditions, industrial structure and medical conditions are all in line with expectations, indicating that these are conducive to promoting poverty alleviation.

Models 2 and 3 verify the effect of labor mobility on intermediary variables. At the level of 1% significance, the median variables - income gap and agricultural development - are significant, indicating that labor mobility can effectively narrow the income gap and promote agricultural development, which is consistent with theoretical analysis. At the level of 1% significance, the income gap and lag period of agricultural development are very significant, indicating that the income gap and agricultural development have a significant time lag effect. The income gap in the early period, the agricultural development will affect the income gap in the current period and the current agricultural development.

Model 6 and Model 7 of Table 4 show that the effect of labor mobility on poverty is influenced by the level of traffic development and industrial agglomeration, the intersection of labor mobility and traffic conditions, the

intersection of labor mobility and industrial aggregation is significant lying at the level of 1% significance, so it can be seen that labor mobility is premised on the improvement of traffic conditions. It can effectively promote the reduction of poverty, and industrial concentration is conducive to promoting the poverty alleviation effect of labor mobility. Therefore, it is known that the Hypothesis 4 test passes.

Taken together, it can be seen that labour mobility does have a direct contribution to poverty alleviation, while labour mobility shows an indirect contribution to poverty alleviation by effectively promoting the narrowing of income gap and agricultural development; Industrial aggregation is conducive to promoting the anti-poverty effect of labor force.

4.3 Subregional Estimation

In order to examine whether there are regional differences in the effects of labour mobility, this paper divides 31 provinces into three regions, east, central and western, and the regression is shown in table 5. Table 5 shows that there are indeed regional differences in the poverty reduction effects of labour mobility. Among them, the poverty reduction effect of labor mobility is the largest in the central, second in the west and the smallest in the east. This is mainly due to the western region is the poorest area of our country, the poorest population and distribution is more dense, but China's rural labor force is basically to the east cross-provincial flow, the western labor flow distance is relatively far, coupled with china's western region traffic conditions are relatively backward, weak transportation infrastructure, increased the cost of labor mobility, The uneven distribution of industries is not concentrated, which limits the frequent and large-scale movement of the western labor force, while the central region has in recent years taken on most of the industrial transfer in the east, especially the labor-intensive industries, to form a more concentrated industrial cluster, which facilitates the frequent movement of labor force close and frequent employment, in addition, the central and eastern close distance, With the convenience of close mobility, with convenient transportation conditions, so that the low cost of labor mobility, promoting the large-scale rural labor movement to the eastern region. Therefore, the labor mobility in the central region has the greatest effect on poverty, the effect of poverty reduction is most obvious, and the effect of poverty reduction in the western region is second.

4.4 Robustness Test

In order to ensure the robustness of the empirical results, this paper replaces the estimation method and uses the static panel model to re-estimate, so as to verify whether the poverty reduction effect of the empirical labor mobility is stable and reliable, and the regression results are shown in Table 6. Table 6 shows that labor mobility still has a significant effect on poverty reduction in the case of increasing control variables in turn, indicating that the empirical results of the preceding paper are stable and reliable.

Table 3: Total sample estimate results

Variables	model(1) *lnpoverty*	model(2) *lngap*	model(3) *lnagri*	model(4) *lnpoverty*	model(5) *lnpoverty*
L.lnpoverty	0.807*** (21.259)			0.774*** (22.314)	0.816*** (37.564)
lnlabor	-0.087*** (-4.427)	-0.011*** (-3.310)	0.024*** (2.586)	-0.056*** (-3.126)	-0.098*** (-6.557)
L.lngap		0.972*** (182.822)			
lngap				-0.088** (-2.404)	
L.lnagri			0.959*** (77.545)		
lnagri					-0.021** (-2.412)
lnurban	-0.055*** (-2.724)	-0.012*** (-2.669)		-0.099*** (-5.813)	-0.051*** (-4.440)
lnindustry	-0.142*** (-4.429)			-0.136*** (-5.385)	-0.106*** (-6.175)
lnfinance	-0.036* (-1.656)			-0.047** (-2.387)	-0.076*** (-4.392)
lntraffic	-0.023*** (-2.872)			-0.033*** (-4.677)	-0.027*** (-4.810)
lnhealth	-0.044*** (-2.605)			-0.044*** (-2.969)	-0.007 (-0.652)

lnopen		0.004*** (3.238)			
lnpergdp		0.004** (2.148)			
lnhuman		-0.003* (-1.943)			
lnfunding			0.017** (2.211)		
lnplough			0.040*** (3.816)		
lnemploy			-0.002 (-0.111)		
constant	2.522*** (5.638)	0.137*** (6.557)	-0.327*** (-2.754)	3.104*** (7.879)	2.435*** (9.535)
observations	961	961	961	961	961
Wald test	3673.587***	40288.090***	120598.540***	3032.270***	23790.540***
AR(1) test	0.000	0.000	0.001	0.000	0.000
AR(2) test	0.068	0.997	0.093	0.084	0.073
Sargan test	29.741	27.366	28.291	28.841	29.147
The corresponding p value	1.000	1.000	1.000	1.000	1.000

Note :( ) figures are values, ***, ** and * are significance levels of 1%, 5% and 10% respectively.

Table 4: Total sample regulatory effect estimation results

Variable	model(6) *lnpoverty*	model(7) *lnpoverty*
L.lnpoverty	0.806*** (20.345)	0.814*** (20.339)
lntralab	-0.070*** (-3.412)	
lnagglab		-0.100*** (-2.856)
lnurban	-0.065*** (-3.147)	-0.068*** (-3.226)
lnindustry	-0.115*** (-2.094)	-0.075*** (-3.030)
lnfinance	-0.040* (-1.696)	-0.013 (-0.756)
lntraffic	0.043** (2.354)	0.005 (0.384)
lnhealth	-0.035** (-2.250)	-0.033** (-2.422)
_cons	2.387*** (4.994)	2.350*** (4.730)
observations	961	961
Wald test	4198.840***	6024.480***
AR(1) test	0.000	0.000
AR(2) test	0.071	0.067
Sargan test	29.544	30.033
The corresponding p value	1.000	1.000

Note :()figures are values, ***, ** and * are significance levels of 1%, 5% and 10% respectively.

Table 5: Regional estimates

Variable	eastern region *lnpoverty*	central region *lnpoverty*	western region *lnpoverty*
L.lnpoverty	0.887*** (29.020)	0.863*** (34.434)	0.785*** (14.954)
lnlabor	-0.041* (-1.777)	-0.051*** (-2.732)	-0.049** (-2.462)
lnurban	-0.010 (-1.004)	-0.061*** (-4.806)	-0.111*** (-3.895)
lnindustry	-0.041*** (-2.693)	-0.067*** (-3.948)	-0.067*** (-2.958)
lnfinance	0.039** (2.313)	0.011 (0.443)	-0.028 (-1.455)
lnhealth	-0.038*** (-3.817)	-0.056*** (-3.119)	-0.027** (-2.043)

_cons	0.873***	1.526***	1.937***
	(3.980)	(8.087)	(5.429)
observations	341	248	372
Wald test	11539.277***	100784.070***	3612.786***
$AR(1)$ test	0.004	0.010	0.005
$AR(2)$ test	0.064	0.134	0.883
Sargan test	9.085	1.321	7.207
The corresponding p value	1.000	1.000	1.000

Note: ()figures are values, ***, ** and * are significance levels of 1%, 5% and 10% respectively.

Table 6: Robustness test results

Variable	(1)	(2)	(3)	(4)	(5)
	lnpoverty	*lnpoverty*	*lnpoverty*	*lnpoverty*	*lnpoverty*
lnlabor	-0.465***	-0.433***	-0.286***	-0.136***	-0.146***
	(-11.117)	(-7.616)	(-3.834)	(-2.532)	(-2.680)
lnindustry		0.091	0.003	-0.010	-0.046
		(1.032)	(0.039)	(-0.151)	(-0.793)
lnurban			-0.220***	-0.068	0.0023
			(-3.912)	(-1.430)	(0.046)
lntraffic				-0.211***	-0.151***
				(-7.823)	(-4.840)
lnhealth					-0.223***
					(-7.526)
_cons	5.448***	4.967***	5.605***	6.897***	7.700***
	(38.187)	(9.584)	(11.642)	(15.573)	(18.961)
observations	992	992	992	992	992
adj. R^2	0.660	0.664	0.710	0.788	0.820

Note: the figures in brackets are t values, ***, **, * are 1%, 5%, 10% of significance level in order.

5. Research Conclusions and Policy Recommendations

Based on the panel data from 1986 to 2017 in 31 provinces of China, the dynamic panel model is set, and the effect and mechanism of labor mobility on poverty are analyzed by systematic estimation method, and the results show that:

1) Poverty has significant time accumulation and continuous effect, with long-term and slow; 2) Labor mobility does play a significant role in poverty alleviation, and will indirectly affect poverty alleviation through income gap and agricultural development; 3) the improvement of transportation conditions and the concentration of industries are conducive to promoting the accelerated movement of labor, and have played an important role in promoting the poverty reduction effect of labor mobility;4) There are regional differences in the poverty reduction effect of labor mobility, the poverty reduction effect of labor mobility in the central region is the largest, and the poverty reduction effect in the eastern region is the least, which has a lot to do with the distribution of poverty in China and the distribution of industry and traffic development. Combined with the above, this paper draws the following recommendations:

(1) Poverty alleviation should be regarded as a long-term task and project, and continuously do a good job in poverty alleviation, to prevent the recurrence and regenerative nature of poverty, to ensure that poverty alleviation work is truly effective in place.

(2) We should take guiding the flow of labor force as an important way to alleviate poverty, actively guide the flow of surplus labor from poor areas and rural areas to urban and rural areas, and create a favorable employment environment for them to ensure that the migrant labor force can be fully employed: at the same time, we should increase investment in agriculture and promote agricultural development.

(3) Promote transportation infrastructure construction in poor areas, improve transportation conditions, enhance exchanges and contacts between poor areas and the outside world, and facilitate the movement of labor.

(4) To speed up the industrial layout, guide the transfer of labor-intensive industries to the central and western regions, form large-scale industrial gatherings, accelerate the development of industrial clusters, in addition, all regions should play a unique comparative advantage, support the development of industrial clusters in line with regional characteristics, and guide the accelerated movement of labor in poor areas.

(5) It is necessary to adopt different measures to guide labor mobility according to local conditions, the eastern region should speed up industrial restructuring, promote industrial optimization and upgrading, and guide the movement of high-quality talents from poor areas to the eastern region; We should promote the concentration of labor-intensive industries in the central region, and the west should speed up the improvement of transportation conditions and promote the accelerated flow of talented labor.

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