

On the Impact of the Development of Agricultural Producer Services on the Transfer of Rural Labor Force

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Abstract: This paper explores the impact of the development of agricultural producer services on the transfer of rural labor force and its mechanism. Based on the panel data of counties in Anhui, Guizhou, Hunan, Shanxi, Zhejiang and Jiangsu from 2005 to 2019, this paper uses the fixed effect model to make an empirical study on the impact of the development of agricultural producer services on the transfer of rural labor force. The results show that the development of agricultural producer services is the key factor leading to the transfer of rural agricultural labor force to non-agricultural industries in the county. Further theoretical and mechanism analysis found that the impact mainly comes from the "thrust" effect brought by the development of agricultural producer services. The conclusion of this paper reveals that the transfer of rural labor force plays an important role in the transformation of China's rural agricultural economic structure.

Keywords: Producer services, Labor transfer, Economic structure.

1. Introduction

The transformation of rural economic structure is extremely important to realize the common prosperity of the whole people as soon as possible, and the transfer of rural labor force is the key factor to promote the transformation of China's agricultural and rural economic structure [1]. At present, China's agricultural economic development is in a period of historical transformation. With the continuous development of the rural land transfer market and the continuous increase of the input of production factors such as chemical fertilizer, pesticide and agricultural plastic film, the demand of China's agricultural producer services has gradually increased, resulting in a sharp decline in the number of labor force required for agriculture, and the rural surplus labor force has shifted to the secondary and tertiary industries. Over the past decade, the proportion of China's agricultural population in the total population has been lower than the world average and is still declining. Previous studies have shown that the improvement of agricultural mechanization, the development of agricultural producer services, the expansion of urban scale and the development of non-agricultural industries are important reasons for promoting the transfer of rural labor force to non-agricultural industries in the county [2-5].

With the advancement of agricultural modernization, agricultural producer services, as an important part of the transformation and upgrading of China's agricultural production mode [6], has become an important starting point for promoting the revitalization of China's rural industries and promoting the organic connection between small farmers and the development of modern agriculture [7]. The development of agricultural producer services has effectively improved the mechanization and professional scale of agricultural production, which can significantly shorten the production time and reduce most intermediary costs. It can also promote the transfer of labor force and give the rural surplus labor force the opportunity to go to the county for reemployment [8]. However, farmers are the main body of building a new countryside. Due to the sustainable development of

agricultural producer services, a large number of rural labor force continue to flow into cities, and the remaining small amount of labor force is difficult to undertake the task of building a new countryside, and rural economic development will also be hindered [9]. Therefore, although agricultural producer services have become an important symbol of agricultural modernization, how to promote the transfer of China's rural labor force has become an urgent problem of people's livelihood and employment.

The main contributions of this paper are as follows: first, the innovation of research perspective. This paper takes the development of agricultural producer services as the "thrust" of rural labor transfer for the first time, and explores its impact and impact mechanism on China's rural labor transfer, which provides a new idea for promoting urban-rural integration and rural economic structure transformation. Second, empirical content is being improved. Most of the existing literature investigates relevant issues at the provincial level or prefecture level city level, and this paper uses county and township level panel data for empirical research. County and township level data can more accurately reflect the economic situation of China's rural macro level, especially in the aspect of agricultural economic development. Therefore, this paper can more carefully study the mechanism of agricultural producer services on the transfer of rural labor force, which will help to enrich the discussion of related issues. Third, the policy recommendations are different from the existing literature, which mainly focuses on the impact of the development of agricultural modernization on the transfer of rural labor force. This paper explores its impact on the transfer of rural labor force in detail from the development of agricultural producer services. Agriculture is the foundation of all industries, and the development of agriculture is related to the foundation of the country. The findings of this paper can be used for reference for the government on how to better promote the transfer of rural labor force. At the same time, under the background of implementing the Rural Revitalization Strategy, the conclusion of this paper also helps the government to improve the relevant policies of agricultural and rural development.

2. Theoretical Mechanism

In the existing literature on China's rural economic structure transformation, the "thrust" formed by agricultural technological progress plays a significant role in promoting the transfer of rural surplus labor force to urban non-agricultural industries [10], and an important part of the establishment of modern agricultural industrial system is the

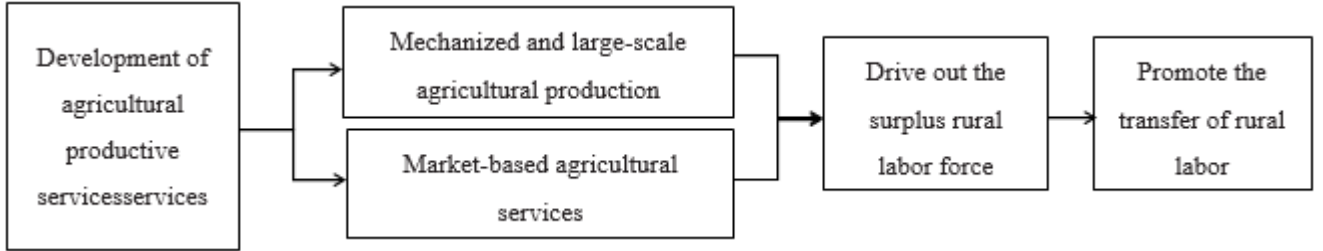


Figure 1. Logical framework of theoretical mechanism

Under the "push" mechanism, the development of agricultural producer services has brought mechanized, large-scale and market-oriented agricultural production services, which has a "push" effect on the transfer of rural labor force through direct and indirect channels. From the perspective of direct impact, as the third driving force in China's agricultural history, agricultural producer services have solved the problems of agricultural machinery replacing human and animal resources and Trusteeship of small farmers' agricultural production [13], thus playing a vital role in promoting the formation and transfer of rural surplus labor force. Therefore, the development of agricultural producer services will directly promote the outflow of rural labor force, making them abandon their original agricultural production activities and seek jobs in the secondary and tertiary industries in areas with better economic development. Under the background of the new generation of farmers getting married and starting a business, because they are leading the direction of the family, different from the "half work and half plough" of the older generation of farmers, the new generation of farmers generally choose to work in the county, or the gender division of labor with the county as the family reproduction site, and the degree of "work" is higher, "farming" has become industrialized agriculture or implicit guarantee [14]. From the indirect impact, agricultural producer services can increase farmers' income and narrow the income gap between urban and rural areas by providing market-oriented services for all links of agriculture before, during and after production [15], and the increase of farmers' income can effectively promote agricultural mechanization [16], so as to promote the transfer of rural labor force.

3. Empirical Analysis

3.1. Model Establishment, Variable Selection and Data Source

3.1.1. Model Establishment

Based on the quasi natural experiments of county expansion and the development of agricultural producer services at the county and township levels in six provinces of Anhui, Guizhou, Hunan, Shanxi, Zhejiang and Jiangsu, this paper constructs an econometric model at the county and township levels and time levels to empirically estimate the impact of the development of agricultural producer services

development of agricultural producer services [11], The most important external pulling force for rural labor force to choose local transfer to non-agricultural is county expansion [12]. Therefore, based on the existing theoretical basis, this paper mainly analyzes how the development of producer services promotes the non-agricultural transfer of agricultural labor force from the "thrust" channel. The specific logical framework is shown in Figure 1.

on the number of rural labor transfer.

Based on the above theory, this paper divides the "thrust" factors affecting the transfer of rural labor force into five aspects: the level of agricultural producer services, the income level of farmers, the number of industrial enterprises above designated size, the proportion of urban non-agricultural output value in the total output value, and the total power of agricultural machinery, and establishes the following empirical research measurement model:

$$Labor_{it} = \alpha + \beta_1 Agr_{it} + \beta_2 Inc_{it} + \beta_3 Firm_{it} + \beta_4 Rat_{it} + \beta_5 Mac_{it} + \mu_{it} \quad (1)$$

Where, labor represents the transfer of rural labor force, Agr represents the development level of agricultural service industry, Inc represents the per capita disposable income in rural areas, Firm represents the number of industrial enterprises above designated size, Rat represents the proportion of urban non-agricultural industrial output value in the total output value, and Mac represents the total power of agricultural machinery. The subscript i represents the region, t represents the time, and α represents the constant, β is the coefficient of each variable and μ_{it} is the residual term.

3.1.2. Variable Selection and Data Source

The explained variable is rural labor transfer, which is measured by the proportion of agriculture, forestry, animal husbandry and fishery employees in the total employees. The core explanatory variable agricultural service level is measured by the proportion of the output value of agricultural service industry to the total output value of agriculture, forestry, animal husbandry and fishery. The level of farmers' income is measured by the indicator of farmers' per capita disposable income. The number of industrial enterprises above designated size and the total power of agricultural machinery represent the basic economic level of the county from the side. The ratio of the output value of urban non-agricultural industries to the total output value indicates the development level of non-agricultural industries.

The data in this paper mainly comes from the county-level data sets in the 2005-2019 statistical yearbook of all provinces in China. For the problem of missing data in a few years, this paper uses trend extrapolation and interpolation to supplement the data. In addition, this paper uses county-level data from various statistical yearbooks to supplement this

variable, including China's county (city) socio-economic Statistical Yearbook (2015-2018). Based on the same method, this paper obtains the total output value of agriculture, forestry, animal husbandry and fishery and the total output value of agriculture, forestry, animal husbandry and fishery services at the county level. Other county-level explanatory variables in

the mechanism analysis are from the county-level data sets of China county Statistical Yearbook (2005-2019) and China Regional Economic Statistical Yearbook (2005-2019).

The results of descriptive statistical analysis of each variable are shown in Table 1.

Table 1. Descriptive statistics of each variable

Variable	Sample size	Mean value	Standard deviation	Minimum value	Maximum value
Labro	5816	0.4868	0.2811	0.0135	0.6633
Agr	5365	0.0361	0,0391	0.0027	0.6154
Inc	5759	8805.379	6460.2	668	39529
Firm	5792	182.3529	285.54377	1	2413
Mac	5817	42.22319	39.75097	0.8383	295.1459
Rat	5816	0.8229	0.1079	0.4262	0.9925

3.2. Empirical Results and Analysis

For the estimation of equation (1), this paper uses fixed effect (FE), random benefit (RE) and Hausman test to explore

the best model estimation results. Take the logarithm of rural per capita disposable income (Inc) to reduce the volatility of variables. The estimated results are shown in Table 2.

Table 2. Estimation results and Hausman test

Variable	Model 1 (FE)	Model 2 (RE)
Agr	-0.2943** (-2.37)	-0.2170* (-1.89)
LnInc	-0.0288*** (-4.60)	-0.0307*** (-5.12)
Firm	-0.0000 (-0.23)	-0.0002*** (-6.40)
Mac	-0.0007*** (-3.08)	0.0000 (0.02)
Rat	-0.1415* (-2.69)	-0.2990*** (-4.82)
Cons	0.8954*** (17.32)	1.0386*** (22.29)
Hausman	79.7	

Note: the data in brackets are the coefficient T value; *, **, *** and * indicate statistical significance levels of 1%, 5% and 10%, respectively.

Hausman test indicates that the fixed effect model is more efficient than the random effect model. According to the regression results of model 1 (FE) in Table 2, in the impact of agricultural producer services on the transfer of rural labor force, the variable regression coefficient of agricultural producer services is -0.2943, indicating that for every unit of increase in agricultural producer services, the proportion of agricultural labor force in the total labor force decreases by 0.2943 units, it shows that the deepening of the development of agricultural producer services can significantly improve the transfer of rural labor force. The level of per capita disposable income of rural residents has a significant and negative impact on the transfer of rural labor force. Every 1% increase in per capita disposable income of rural residents will reduce the rural labor force by 2.88%. A higher income level will attract more agricultural labor force to transfer to the secondary and tertiary industries, and then promote the transformation of agricultural economic structure. Among the

economic impacts of entity enterprises in the county, the number of Industrial Enterprises above designated size has no significant impact on the transfer of rural labor force. The reason may be that industrial enterprises need knowledge-based talents or new technology talents rather than ordinary labor force. Therefore, the number of Enterprises above designated size has less impact on the transfer of rural labor force, the introduction of rural labor force by industrial enterprises is low. In the influence of the total power of agricultural machinery on the transfer of rural labor force, the regression coefficient of the total power of agricultural machinery is -0.0007, which shows that the improvement of the total power of agricultural machinery is helpful to accelerate the transfer of rural labor force, but the degree of transfer is small. With the increasing proportion of the output value of non-agricultural industries in the total output value of the region, the transfer of rural labor force is greatly affected, and the regression coefficient is -0.1415, which shows that when the non-agricultural economy of the county continues to develop, the employees of the primary industry will gradually penetrate into the secondary and tertiary industries, so as to promote the transfer of labor force and

complete the transformation of agricultural economy.

4. Conclusions and Suggestions

4.1. Conclusions

Under the framework of analyzing the impact on the transfer level of rural labor force in Central China from the perspective of the "thrust" effect of agricultural producer services, based on the panel data of counties in Anhui, Guizhou, Hunan, Shanxi, Zhejiang and Jiangsu from 2005 to 2019, this paper adopts the methods of fixed effect (FE) and random effect (RE), Establish the influencing factor model of rural labor transfer for empirical research, and use Hausman test to select the best empirical method for research. The research shows that in terms of "pull" effect, the development of agricultural producer services will liberate rural labor force and improve the outward transfer level of rural labor force; the disposable income level of rural residents is the material basis for people to yearn for a better life. The increase of income level will improve the willingness of rural residents to transfer to a better living environment, thus improving the level of rural labor transfer to cities; With the popularization of rural mechanized equipment, the total power of agricultural machinery has been continuously improved, and rural mechanical equipment has gradually replaced human labor, promoting the infiltration of rural surplus labor force into secondary and tertiary industries; Small farmers in large countries are China's long-term national conditions. China's agricultural economy needs to be continuously reduced in order to meet the basic national conditions of developed countries. With the increasing proportion of the output value of non-agricultural industries in the regional total output value, the rural labor force continues to turn to learn new knowledge and enter the secondary and tertiary industries, so as to significantly promote the level of labor transfer.

4.2. Suggestions

Based on the above research conclusions, this paper gives the following policy suggestions: first, the development of agricultural producer services is the main "thrust" of the transfer of rural surplus labor force. The key lies in improving the level of agricultural technology and increasing the application of agricultural producer services. First, the government should increase the input of public goods in agricultural productive services to make up for the lack of output power of private agricultural producers. At the same time, we should establish an agricultural service extension system covering the vast rural areas, so that various agricultural services and technologies can be applied as soon as possible. Second, continue to promote the construction of new urbanization and expand the absorption capacity of new urbanization to the transfer of rural surplus labor force. In general, improve the mechanisms of citizenship of migrant workers, integrate migrant workers into the urban social security system as soon as possible, make them enjoy basic public services on an equal footing with urban citizens, and reduce the cost of the citizenship of migrant workers. Third, in terms of the scale of non-agricultural industries, we should actively promote the development of urban non-agricultural industries and effectively use customs, traditions and regional characteristics to develop tourism and ancillary industries. In terms of system, we will deepen institutional reform and improve the institutional system until the dual household registration system eliminates the obstacles to the transfer of

surplus rural labor force. The government should play a leading role, make full use of the rural market information resources, open up transfer channels, increase the skill training of rural surplus labor force, and improve the employment competitiveness of rural surplus labor force.

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