

A Study on the Impact of Agricultural Land Transfer on Farm Household Income

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ABSTRACT

Through the analysis of data of Chinese Family Panel Studies from 2016 to 2018, this paper uses the propensity score matching method to empirically study the significant income-increasing effect of agricultural land transfer on farm household income. A breakdown of farm household types and income structures reveals that there are significant differences in the mechanism of the income growth effect for rent-in and rent-out households. Based on this, this paper puts forward the following policy recommendations: the government should provide more infrastructure construction, tax incentives and financial support for agriculture to agricultural operators, invest more in rural human capital and intellectual support, and give full play to the role of rural finance in supporting agricultural land transfer, strengthen the financial rights of agricultural land.

Keywords: *Agricultural land transfer, Farm household income, Propensity score matching method.*

1. INTRODUCTION

Under China's policy of "separation of three rights", a large amount of idle land in rural areas is being activated by the market, with the area of land transferred increasing year by year and the forms of transfer showing diversification. According to the China Bureau of Statistics, the area of arable land transferred in China exceeded 530 million mu in 2018, an increase of 18.6% over 2015. Although the policy effect has been initially highlighted, ineffective and inefficient transfer situations still exist [1], and problems such as false mortgages on agricultural land, difficulties in disposing of collateral, and high flow costs due to unclear ownership remain severe, seriously affecting the efficiency of agricultural land transfer and large-scale land operation. In this context, whether agricultural land transfer can effectively increase the household income of farmers has become a key issue in the reform of the rural economic system and deserves in-depth study.

2. LITERATURE REVIEW

Coase argues that we would say that someone owns land and treats it as a factor of production, but what the landowner actually has is the power to perform certain actions [2]. If the costs of the transaction are higher than the benefits of the transaction, then the transaction will not take place. According to existing practices and

follow-up studies, land transfer significantly increases the total income level of farm households [3]. It improves the efficiency of land resource allocation through the marginal output levelling effect and the transaction benefit effect [4]. It increases the value-added of production efficiency by achieving large-scale operation [5]. Else, it can increase the household income of farmers by expanding their non-farm employment space and gaining more non-farm employment opportunities. It is also argued that land transfer does not necessarily increase farmers' income, which may be due to rural residents' failure to exploit their comparative advantages when choosing employment. At the same time, elements of land management, such as roads, water resources and labour, are often embedded in village social relations, and foreign land operators are highly likely to encounter rejection from their own villages in these areas, adding much uncertainty and increasing the cost of production and operation [6]. In addition, although land transfer facilitates the efficient allocation of land resources to a certain extent, it may sacrifice the interests of some small farmers, leading to "no land for the cultivator" and increasing the gap between the rich and the poor [7].

Most of the existing literature examines the impact of agricultural land transfer on the net or total household income of farmers, but the study only from the perspective of net or total household income cannot

fully reveal the endogenous dynamics of the income effect, and lacks research on the structure of farm household income and its influence mechanism. Secondly, in terms of research methods, the existing literature mostly adopts traditional linear regression methods such as OLS and quantile regression, but these methods cannot overcome the selectivity bias caused by sample "self-selection" and ignore the heterogeneity of land transfer among different types of farm households. Based on data from the 2016 and 2018 Chinese Family Panel Studies, this paper uses propensity score matching to measure the effect of agricultural land transfer on the net income and income structure of farm households, and to explore the differences between groups.

3. THEORETICAL MECHANISMS AND RESEARCH HYPOTHESES

Because of the heterogeneity of farm households, the resource endowment of their own factors determines whether their participation in land transfer is rented in or rented out. Farmers may choose to rent in land when their income from land production and management is greater than the sum of the opportunity cost of farming the land and the land rent paid. In the other hand, they may choose to rent out land when the sum of the land rent received and the expected income generated from engaging in non-farm activities is greater than the income received by farmers from producing and managing the land themselves [8].

The income effect of agricultural land transfer differs for different types of farmers (rent-in households and rent-out households). For rent-in households, the transfer of land expands the area of land management, and enables the development of industrialised agricultural production and operation. Also, rent-in households can choose to grow crops with higher economic value, thus increasing their household business income. For rent-out households, renting out land will bring income from the transfer of land, and farmers can obtain corresponding rents, interest income and other remuneration, thus increasing the property income of farm households. Else, renting out land also helps surplus labour to transfer to the non-farm sector and urban sector for employment, and farmers can break free from the shackles of land and move to urban areas to obtain non-farm employment income, thus increasing the wage income of farm households [9].

Based on this, the following hypothesis is proposed in this paper.

Hypothesis 1: Agricultural land transfer raises the net income of farm households.

Hypothesis 2: Rent-in households contribute to household income growth by raising business income, and rent-out households contribute to household income growth by raising property and wage income.

4. EMPIRICAL ANALYSIS

4.1. Model setting

Based on the counterfactual analysis framework [10], this paper sets the dummy variable $D_i = \{0, 1\}$ indicating whether farmer i participates in land transfer, with $i = 1$ indicating participation and vice versa. The general idea of the Propensity score matching method approach to the self-selection problem is to select a non-transferring household for each farmer involved in land transfer, based on a sample set of farmers not involved in land transfer, and to ensure that the characteristics of the two samples of farmers are similar, except for differences in their decision to participate in land transfer or not. The average treatment effect after propensity score matching ATT is

$$\begin{aligned} \text{ATT} &= E(Y_1|T = 1) - E(\hat{Y}_0|T = 1) \\ &= E(Y_1 - \hat{Y}_0|T = 1) \end{aligned} \quad (1)$$

Y_1 is the level of household income of farmers participating in land transfer, and \hat{Y}_0 is the estimated level of household income of farmers in the participating land transfer group when they did not participate in the transfer.

4.2. Variable settings and data sources

(1) The dependent variable. In order to overcome the non-linearity problem among the variables and ensure the smoothness of the data, this paper takes the natural logarithm of net household income, business income, wage income, transfer income and property income after adding 1 and uses it to characterize each variable separately.

(2) Core independent variables. The core independent variable in this study is whether farmers participate in land transfer. Farmers have three decision options - renting in land, renting out land and not participating in land transfer, which are recorded as 1 if farmers rent in land and 0 if they do not participate in land transfer, and 1 if farmers rent out land and 0 if they do not participate in land transfer.

(3) Control variables. In this paper, household head characteristics, household characteristics and village characteristics were selected as control variables, and regional dummy variables were added. Three variables were selected to characterise the characteristics of the household head: age, years of education and health status of the household head. Household characteristics include total household size, value of agricultural machinery, value of consumer durables and value of household financial assets. In order to ensure smooth data, the above value variables are added by 1 and then taken as natural logarithms, and are used to characterise each value variable separately. Village characteristics

include the distance from the nearest town, the economic status of the village and the topographical characteristics of the village.

The data in this paper are obtained from the Chinese Family Panel Studies and are divided into rented-in and rented-out households, taking into account the heterogeneity of farmers themselves. The rented-in land equation dataset includes 1138 rented-in farmers and 5650 non-transferred farmers, totalling 6788 households; the rented-out land equation dataset includes 1164 rented-out farmers and 5650 non-transferred farmers, totalling 6814 households.

Table 2. Analysis results of group difference

Rented-in						
Projects	Classification criteria	Net income	Business income	Wage income	Property income	Transfer income
Education level	Illiterate	0.177**	0.747**	0.152	0.086	0.095
	Primary School	0.146**	0.960***	-0.409	0.095	-0.330
	Junior High School	0.031	0.754***	-0.474	0.011	0.005
	High School and above	0.020	0.752	0.162	-0.149	0.090
Rented-out						
Projects	Classification criteria	Net income	Business income	Wage income	Property income	Transfer income
Education level	Illiterate	0.110	-1.767***	0.561	4.683***	0.424**
	Primary School	-0.006	-2.502***	0.452	5.380***	-0.080
	Junior High School	0.214***	-1.960***	0.798***	5.562***	0.236
	High School and above	0.240***	-2.256***	0.828**	5.411***	0.375

In this paper, the average treatment effect of farmland transfer on the net household income and income structure of farm households was measured using k-nearest neighbour matching (k=4) in the propensity score matching method, and the results are shown in the table 1. In terms of net household income, both land rented-in and land rented-out significantly increased the net household income of farm households compared to non-transferred households. The average treatment effect of land rented-in households after participating in land transfer was 0.118, which was significant at the 1% level, indicating that the net household income of farmers who rented in their land increased significantly by 11.8%. The average treatment effect of land rented-out households after participating in land transfer was 0.137, which was significant at the 1% level, indicating that the net household income of farmers who rented out their land increased significantly by 13.7%. In terms of income structure, rented-in households increased their net household income mainly through an increase in business income. Rented-out households increased their net household income mainly

4.3. Impact effect measurement

Table 1. Impact effect measurement results

Income Structure	Rented-in		Rented-out	
	ATT	t	ATT	t
Net income	0.118***	3.52	0.137***	3.32
Business income	0.873***	5.72	-2.250***	-15.36
Wage income	-0.072	-0.43	0.629***	3.45
Property income	0.038	0.94	5.241***	53.02
Transfer income	-0.074	-0.63	0.308***	2.59

through an increase in property income, wage income and transfer income.

4.4. Group Difference Analysis

In fact, there is considerable variation in the effect of farm household heterogeneity on the income impact of agricultural land transfers. In view of this, this paper groups farm households according to the education level of the household head in order to further investigate the cohort differences. The results of the impact effects of the different clusters, as measured by k-nearest neighbour matching (k=4), are shown in the table 2. As can be seen from the table 2, renting in land has a significant contribution to net household income for less educated farmers, and renting out land has a more significant effect on income for more educated farmers. Possible reasons for this are that for more educated farmers, who have a wealth of expertise and social capital, there are more off-farm employment opportunities, which can contribute to higher net household income through higher wage income.

5. CONCLUSIONS

The results of the above study show that the transfer of agricultural land significantly increased the level of farm household income. Further analysis shows that the net household income of rented-in households is increased mainly through the increase of business income. While rented-out households mainly rely on the increase of property income, wage income and transfer income to increase their net household income. Educational level has different effects on household income for rented-in and rented-out households. Less educated farmers' renting in land has a significant contribution to net household income, while more educated farmers' renting out land has a significant contribution to net household income.

In response to the above findings, the suggestions put forward in this paper are as follows. It is necessary for the government to introduce relevant policy measures to ensure that the relevant agricultural subsidies are implemented for the actual land users. The government's infrastructure construction, tax concessions and financial support for agriculture should be tilted more towards agricultural operators. Investment in rural human capital and intellectual support should be increased. The transformation of farmers' perceptions from traditional to modern should be promoted, and farmers should be guided to change from geo-cooperation and blood-cooperation to credit-cooperation and contract-cooperation. Finally, we should give full play to the role of rural finance in supporting land transfer in a comprehensive manner, especially to strengthen the financial rights of agricultural land. In order to exploit the economic attributes of agricultural land, it is particularly important to improve the rural financial system.

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