Influence of Land Right Registration on Agricultural Land Transfer

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Abstract. In order to encourage scale operation of agriculture through land transfer in China, this paper makes a regression analysis on the influence of land right registration on farmers' agricultural land transfer behavior through Probit model and Tobit model, explores the adjustment effect of land rent on this influence, and makes group regression based on farmers' operation scale and regional differences. The results show that the probability of land transfer is significantly higher for farmers whose land is registered than whose land is not. Land right registration has a significant positive impact on the land transfer area and land rent has a positive adjustment effect on this impact. Based on this, this paper provides ideas for reasonably guiding land transfer.

Keywords: Land Right Registration, Land Transfer, Agricultural Land

1 Introduction

With the rapid progress of industrialization and urbanization in China, a large number of rural labor force has been transferred, and the rural land transfer[1] behavior is increasing. As the key actors in land transfer, farmers' willingness to transfer directly affects the large-scale operation of land. Their willingness to transfer is greatly influenced by property rights relations, and the stability of these relations will directly affect the efficiency of rural land transfer. Therefore, clarifying the subject and ownership of land property rights can enhance farmers' awareness of land transfer, which is of great significance for deepening rural reform and achieving agricultural scale, intensification, and modernization [1] .

Therefore, under the current situation where the new round of land ownership registration, studying rural land transfer under registration can provide valuable scientific references for improving the ownership system and promoting land transfer. This paper will explore the influence of land ownership on land transfer behavior, and make a simple test, so as to provide ideas for encouraging land transfer and promoting moderate scale operation of agriculture.

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[1] The transfer of land management rights by peasant households with land contractual management rights to other peasant households or economic organizations, that is, to retain the right to contract and transfer the right to use. In 2014, the State Council issued documents requiring the vigorous development of land transfer and appropriate scale operation, and the registration of land right to contractual management within five years.

2 Literature Review

2.1 Significance of Land Right

Many studies have shown that land right registration is conducive to protecting farmers' legitimate rights and interests, promoting transfer and improving farmers' income and land output benefits: Zhong Funing pointed out that the registration of property rights can enrich farmers' property rights and reduce the transaction cost of agricultural land market[2]; Li Zhongand others pointed out that the registration of rural land rights is not only conducive to weakening the excessive dependence of rural finance on acquaintance society, but also can enhance farmers' participation opportunities and promote the improvement of rural financial transaction environment [3].

2.2 Land Transfer's Benefits and Factors

land transfer is actually the transfer of land management rights, and it is an economic behavior of transferring farmers' land management rights to other farmers or organizations on the premise of ensuring the unchanged land contracting rights [4]; Zhang Menglin pointed out that the transfer of collective construction land has changed the way of resource allocation and adapted to the inherent requirements of the development of market economy [5].

The agricultural land system, property rights, social and economic development level, farmers' resource endowment and policy guarantee have been widely valued by scholars: Xie Xiaorong pointed out that the development of rural economic development level, farmers' awareness of rights and policy protection have restricted the development of agricultural land transfer [6] ; Bao Zongshun pointed out that the development level of rural non-agricultural industries and the level of per capital net income have significant effects on rural land transfer [7].

2.3 Correlation between Land Right and Land Transfer

A considerable number of scholars agree that there is a positive correlation between stable land property rights and land transfer. Jiang Tao and others pointed out that from the perspective of land transfer, rural contracted land registration and certification can significantly promote agricultural land transfer [8]; Ding Ling and others pointed out that the issuance of land right registration certificate could improve the marginal effect of participation in land transfer and promote the transfer of agricultural land [9].

In addition, some studies have pointed out that there is a negative impact between land ownership and land transfer: Zhong Wenjing and others have pointed out that both legal empowerment and social recognition will strengthen property rights and further inhibit farmland transfer [10]; Jie Cai and others pointed out that the endowment effect and the incompleteness of land property rights led to a certain inhibition on farmers' participation in farmland transfer [11]. It can be seen that there are still different opinions on the correlation between land ownership and land transfer. This paper will explore the influence of land ownership on land transfer and its influence mechanism from this perspective, and provide some thoughts for this topic.

3 Data and Models

3.1 Data Sources

In this paper, the data of China Health and Retirement Long-term Study (CHARLS) in 2018 are used for analysis. By merging and sorting out the survey data of personal basic information, family income and expenditure and other sectors in the CHARLS project, the number of effective samples in this paper is 2138 after excluding the samples with weak reference. The data used in this paper include the relevant information such as whether the farmers' families confirm the land, whether they transfer the land and its transfer area, the personal characteristics of the interviewee and the family characteristics of the interviewee.

3.2 Variable Selection

In the choice of explanatory variables, this paper takes "whether to confirm the land right" as the core explanatory variable to explore, this paper also selects two aspects of personal and family characteristics as control variables.

In the selection of explained variables, this paper takes "whether land transfer is carried out" and "land transfer area" as explained variables. The former discusses the influence of land right registration on farmers' willingness to make land transfer decisions, while the latter discusses the influence of land right registration on land transfer behavior. This paper takes land lease-out as the index to explore land transfer, that is, the interpreted variables are actually "whether to lease out land" and "land lease-out area". The variable explanation and descriptive statistics are shown in Table 1.

Table 1 Variable Interpretation and Descriptive Statistical Results

variable	Interpretation and assignment	Mean	S.D.
Explained variable			
Whether to carry out land transfer	Whether the family has agricultural land (cultivated land, woodland, pasture, pond) to rent to others; Yes =1, No =0.	0.187	0.390
land transfer area	Area of agricultural land leased by households (unit: mu)	1.104	13.562
Core explanatory variable			
whether to register	Whether the family agricultural land is registered; Yes =1, No =0.	0.518	0.500
Control variable			
gender	Male =1, female =0	0.405	0.491
age	Respondents' age	54.832	6.296
marital status	Married =1, unmarried, widowed or divorced =0.	0.82	0.384
Education level:			
Primary school	Primary school educated; Yes =1, No =0.	0.23	0.421
Junior high	Junior high educated; Yes =1, No =0.	0.241	0.428
Senior high	Senior high educated; Yes =1, No =0.	0.083	0.276
College or above	College educated or above; Yes =1, No =0.	0.016	0.125
Health status	Ranking 1~5 from "very healthy" to	2.952	1.007

	"unhealthy"		
Family size	Number of family members in 2018	2.399	0.885
Agricultural income	Total output value of agricultural, forestry, animal husbandry and fishery products in 2018 (unit: yuan)	10302.736	50412.715
Agricultural assets	Value of agricultural fixed assets (tractors, threshers, etc.) in households in 2018 (unit: yuan)	1639.815	18921.834
Land area	Area of allocated agricultural land (unit: mu)	7.615	45.768
Running businesses	Whether engaged in self-employment or start private enterprises; Yes =1, No =0.	1.888	0.316
Employed	Whether have non-agricultural wage income; Yes =1, No =0.	0.203	0.402

3.3 Research Hypothesis

After consulting relevant literature and combining descriptive statistics of data, this paper puts forward the following assumptions:

H1: Farmers' families who have registered the agricultural land are more likely to transfer the land;

H2: On average, the farmers' families who have registered the ownership of agricultural land have a larger area of circulating agricultural land;

The assumptions are based on the following two points:

3.3.1 Registered Families have Conditions Conducive to Land Transfer

The distribution map shows the area of agricultural land allocated by the registered households and the unregistered households, as shown in Figure 1.

As can be seen from Figure 1, the area of agricultural land collectively distributed by unregistered households is the most concentrated in about 1 mu, while the agricultural land collectively distributed by registered farmers is the most concentrated in about 3-4 mu, which is obviously higher than that of unregistered farmers. It can be considered that due to the geographical characteristics and agricultural endowment of the registered farmers' families, they will have larger agricultural farmland, which is more conducive to transfer.
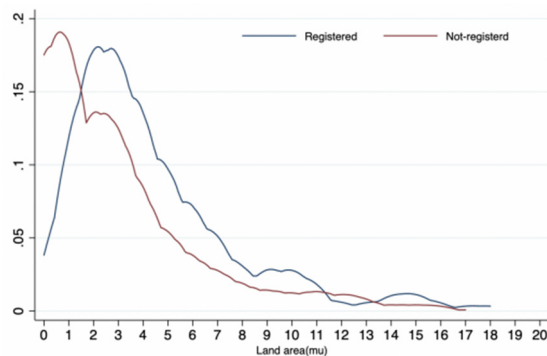

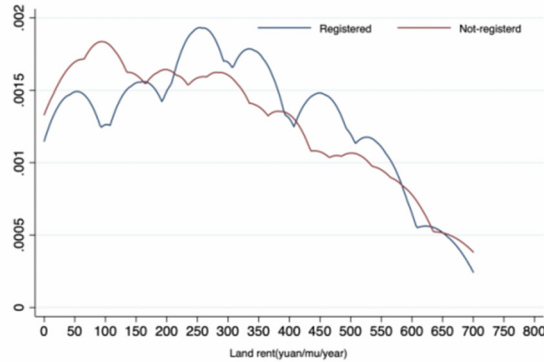**Fig. 1** Distribution map of cultivated land area

Fig. 2 Distribution map of cultivated land rent

3.3.2 Land Rights Improves the Value of Land Property Rights

Land ownership can encourage farmers' families to transfer land by increasing the property value of land and raising rents. The rent distribution map of two types of family rented cultivated land is shown in Figure 2.

Through descriptive statistics, the average rent of cultivated land in all samples is 282.607 yuan/mu/year. From the distribution map in Figure 2, it can be seen that the cultivated land rent of the registered households is more concentrated above the average value, while the cultivated land rent of the unregistered households is more concentrated in 100 yuan/mu/year. It can be considered that the registered households can rent cultivated land at a higher rent than the unregistered households.

3.4 Model Design

In order to verify the above hypothesis, this paper uses Probit model and Tobit model to analyze based on "whether land transfer is carried out" and "land transfer area".

(1)Probit model

As the "whether to transfer land" is a variable of 0-1, the Probit model is adopted to explore the influence of land ownership on farmers' families' decision-making on agricultural land transfer, and the following model is established:(α、 β、 $\theta$are the control variables, which includes two aspects: personal characteristics and family characteristics.)

$$\Pr(trans_i = 1 \mid X_i) = \partial(\alpha + \beta right_i + \gamma control) \tag{1}$$

(2)Tobit model

Because nearly 70% of the samples are not involved in land transfer (that is, the land transfer area is 0), a large number of observation data are compressed at one point. Tobit model is adopted to explore the influence of land ownership on the transfer area of agricultural land of farmers' families:

$$lntranseara_i = \alpha + \beta right_i + \gamma control + u \tag{2}$$

In addition, the adjustment effect of land rent on this correlation are analyzed by entering the

cross term of "agricultural land rent" （$\delta rent_i * right_i$）:

$$lntranseara_i = \alpha + \beta right_i + \partial rent_i + \gamma control + u \tag{3}$$

$$lntranseara_i = \alpha + \beta right_i + \partial rent_i + \delta rent_i * right_i + \gamma control + u \tag{4}$$

4 Empirical Analysis

4.1 Benchmark Regression

4.1.1 The Registration Significantly Improves the Probability of Transfer

In order to verify H1, this paper analyzes the influence of rural household land ownership on land transfer decision-making. The basic method is to estimate the model (model 1) which only contains the core explanatory variables, and then gradually add the control variables for analysis (models 2 and 3), and at the same time introduce the marginal effect of model 3 with all the control variables. The regression results are shown in Table 2.

Table 2 Probit regression results of influencing factors of "whether to transfer land"

variable	(1) Whether to transfer	(2) Whether to transfer	(3) Whether to transfer	marginal effect
whether to register	0.337***	0.361***	0.601***	0.145***
	(0.0639)	(0.0668)	(0.0745)	(0.017)
Control personal characteristics	NO	YES	YES	YES
Control family characteristics	NO	NO	YES	YES
LR chi2	28.08***	45.31***	188.70***	
pseudo R2	0.0136	0.0234	0.0977	
observations	2138	2025	2017	2,017

From Table 2, it can be seen that the probability of land transfer of farmers' families with land right registration is significantly higher than that of farmers' families without land right registration, and this difference is always significant after the control variables of personal characteristics and family characteristics are gradually added. It can be seen from the marginal effect of the output model 3 that at the level of 1% significance, the probability of land transfer of farmers' families with land right registration is 14.5% higher than that of farmers' families without land right registration, and the difference is obvious.

4.1.2 Land Rights Significantly Increase Transfer Area

Through the 0-1 variable of "whether land is transferred or not", the influence of land ownership and other factors on land transfer decision-making was investigated. In order to further investigate the degree of this influence and verify H2, the following paper analyzes the influence of land ownership on the land transfer area of farmers' families. The basic method is to estimate the benchmark model (model 3) containing only control variables, and then add the

core explanatory variables for analysis (model 4). The results are shown in Table 3.

Table 3 Tobit regression results of influencing factors of transfer area

variable	（4） transfer area	（5） transfer area	（6） transfer area
whether to register	0.755***	0.791***	1.173***
	(0.1390)	(0.1430)	(0.1460)
Control personal characteristics	NO	YES	YES
Control family characteristics	NO	NO	YES
LR chi2	30.94***	46.67***	195.08***
pseudo R2	0.0103	0.0166	0.0695
observations	2138	2025	2017

As can be seen from Table 3, there is a significant positive correlation between land ownership and land transfer area. After adding the control variables of personal characteristics and family characteristics, the land ownership behavior is still positively correlated with the transfer area at a significant level of 1%: on average, the area of agricultural land transfer is 117.3% higher than that of unregistered farmers' families, and the difference caused by land ownership is very obvious. In the sense of statistics and economics, the registration of land rights has a close influence on the land transfer area.

4.2 Adjustment Effect Regression

In the process of literature research, we can see that land rent is the key link in the relationship between land ownership and land transfer. In order to further explore the influence mechanism of land ownership on land transfer, this paper introduces the regulating variable land rent to explore the regulating effect of land rent on land ownership and land transfer. The regression results of introducing the cross item "Land rent * Whether to register" are shown in Table 4. The adjustment effect of land rent on land ownership and land transfer is positive, that is, the higher the local agricultural land rent, the greater the promotion effect of land ownership on land transfer.

Table 4 Regression results of influencing factors of transfer area with cross terms

variable	（7） Transfer area (Tobit)	（8） Transfer area (Tobit)
whether to register	0.0668*	0.0662*
	(0.0385)	(0.0386)
Land rent	0.00589	0.0497***
	(0.0303)	(0.0180)
rent *"whether to register"	0.0666*	
	(0.0370)	
Control variables	YES	YES
LR chi2	255.22***	251.98***
pseudo R2	0.0899	0.0888
observations	1316	1316

4.3 Difference Test

4.3.1 Regional Differences

In order to further explore the regional differences of land ownership on land transfer behavior, this paper divides the samples into four groups according to the seven common geographical divisions in China, namely, Northeast China, North China, Central China and East China, and makes a comparative analysis of the influence of "registration" on "transfer" in different regions. The marginal effect of Probit regression results is shown in Table 5.

Table 5 Regression results of influencing factors on whether farmers transfer land in different regions

variable	Whether to transfer (Probit)			
	northeast	North	central	East China
whether to register	0.415***	0.196***	0.0967**	0.239***
	(0.1260)	(0.0362)	(0.0419)	(0.0351)
Control variables	YES	YES	YES	YES
LR chi2	41.99***	72.61***	70.27***	92.82***
pseudo R2	0.4574	0.3287	0.1805	0.1521
observations	94	303	376	541

It can be considered that the structure of land resources is an important reason for this difference: the agriculture in the northeast of China is mainly based on grain production, and the land resources are dense and relatively concentrated. The registration of land rights enables farmers to clarify the property rights and use rights of their land, reduces the uncertainty and risks of land transfer, and makes farmers more willing to lease their land to specialized agricultural enterprises or cooperatives for large-scale operation.

4.3.2 Scale Differences

The farmers' operation scale is closely related to the transfer decision. Therefore, based on the average operation scale of 3.2 mu, this paper divides the samples into two groups: large-scale farmers (with a operation area bigger than 3.2 mu) and small-scale farmers (with a operation area smaller than or equal to 3.2 mu), and makes regression to analysis the effects of "registration" on "whether to transfer" (Probit) and "transfer area" (Tobit) respectively.

The results are shown in Table 6. Among the small-scale farmers whose operation scale is smaller than or equal to 3.2 mu, the behavior of land right registration affects the transfer decision at a significant level of 1%: the probability of land transfer by the registered households is 10.1% higher than that of the unregistered households, and the average transfer area is 53.3% higher.

Table 6 Regression results of land transfer based on farmers' operation scale

variable	Whether to transfer (Probit)		Transfer area (Tobit)	
	Operation scale		Operation scale	
	> 3.2 mu	< =3.2 mu	> 3.2 mu	< =3.2 mu
whether to register	0.000253	0.101***	0.0346	0.533***

	(0.0311)	(0.0208)	(0.0599)	(0.1260)
Other variables	YES	YES	YES	YES
pseudo R2	0.1396	0.1906	0.0744	0.1771
LR chi2	122.05***	197.11***	146.31***	230.85***
observations	799	1218	799	1218

4.4 Robustness Test

According to the principle of tool variable selection and the availability of sample data, combined with relevant literature [12] , select "the number of registered households in the community" as the instrumental variable of farmland right registration. The regression results are shown in Table 7. The significant level of 1%, indicating that the results of this paper are robust.

Table 7 Robustness test

variable	IV-Probit		IV-Tobit	
	Whether to transfer	whether to register	transfer area	whether to register
whether to register	0.772***		1.561***	
Number of people who registered in the community		0.0663***		0.0663***
Control variables	YES	YES	YES	YES
Wald chi2	134.94***		116.81***	
observations	2017	2017	2017	2017

5 Conclusions and Suggestions

In this paper, based on the data of the follow-up survey of health and old-age care in China in 2018, the Probit model and Tobit model are used to analyze the influence of land ownership on agricultural land transfer, and the following conclusions are drawn by introducing the cross term of land rent and group regression analysis: (1)The probability of land transfer is 14.5% higher and the land transfer area will be significantly higher on average. The registration of land rights has significantly improved the probability and scale of land transfer for farmers' families; (2)The positive correlation between land ownership and land transfer is positively regulated by land rent; (3)The registration of land rights strengthens the property value of land, increases land rent, changes the supply and demand of land, and mobilizes the enthusiasm of land transfer.

Based on the above conclusions, this paper puts forward the following suggestions: First, to create better conditions for agricultural capital efficiency from the industrial and financial policy level; Second, to improve the employment ability of farmers to participate in non-agricultural fields, and enhance farmers' enthusiasm for land transfer. Last, to increase investment in agricultural technology. With the agricultural technology and land output greatly improved, the higher the actual land rent, the more significant the role of land ownership in promoting land transfer will become.

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