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Thesis

Title: The Influence of household-level Factors on Farmers'
Willingness of Agricultural Land Circulation in China: Based on Survey
Data From 28 Provinces

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Title The Influence of household-level Factors on Farmers' Willingness of Agricultural Land Circulation in China
—— Based on Data From 28 Provinces

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Summary

In the past decade, urbanization has become the biggest driving force for China's economic growth and social development, and the trend of rural land circulation related to this has become increasingly obvious. Land circulation could help sending agricultural labor to cities, raising the level of civilization in rural China and providing a spatial basis for urbanization.

China's urbanization development requires land circulation, but the current phenomenon of harming farmers' interests in land transfer strengthens the social security function of land, and reduces the willingness of farmers to transfer land. The low willingness constrains the speed and efficiency of land transfer, which in turn will hinder the urbanization process.

Studying the influencing factors of farmers' willingness can help us correctly understand the problem of land transfer in China. Households are the basic organizations for farmers to participate in social activities, and their structure, stability have great impact on households' transfer willingness.

The dataset used in this study is the survey data of the "Thousand Investigators & hundred Villages" social survey held by the School of Public Administration of Renmin University of China in 2017. The research strategy of this study is desk research of secondary quantitative data. The Data analysis method is Probit model.

The findings and results show that there are 8 household-level factors have a significant impact on farmers' willingness to land transfer through five different mechanisms. Village cadre experience / land transfer experience has a negative and positive impact on land transfer willingness through the perception of circulation risk. Non-rural residence ratio and age of the head of the household positively affects transfer willingness through family preference for land income. Agricultural labor ratio and actual managing area ratio have a negative impact on transfer willingness through active dependence on farmland. Family decision mode influences the transfer willingness through the procedural cost of the decision. The willingness to transfer households in democratic decision-making is low, and the willingness of dictatorships to transfer land is high.

The government could take some measures to increase the willingness of household to transfer land. Firstly, strengthen the construction of rural social security systems and reduce farmers' passive dependence on land. Secondly, encourage the "active dependence" farmers to transfer land through vocational training. Thirdly, strengthen agricultural modernization, and encourage efficient "active dependent" households to form scale operations. Fourthly, increase information disclosure, promote land transfer policies, regulate the behavior of village collectives and local governments, and reduce farmers' concerns about land transfer risks. Finally, regulate the land transfer process, strengthen the supervision of the land transfer market, form a reasonable farmland transfer price in the circulation market, and increase farmers' income preferences for land transfer.

Keywords

The Influence of household-level Factors on Farmers' Willingness of Agricultural Land Circulation in China: Based on Survey Data From 28 Provinces

iii

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The Influence of household-level Factors on Farmers' Willingness of Agricultural Land Circulation in China: Based on Survey Data From 28 Provinces

iv

Abbreviations

IHS	Institute for Housing and Urban Development
UCR	Urban Competitiveness and Resilience
CPC	Communist Party of China
TW	Transfer willingness
RUL	Regional urbanization level
HPS	Household population structure
THH	Trait of the head of household
DMSH	Decision mode and stability of the household
LUCH	Land use characteristics of the household
UR	Urbanization rate
VL	Village location
NRR	Non-rural residence ratio
ALR	Agricultural labor ratio
FDI	Family dependency index
AH	Age-head
MH	Martial-head
HH	Health-head
VCH	Village cadre-head
FDM	Family decision mode
FCT	Family conflict type
CF	Conflict frequency
AMAR	Actual managing area ratio
LTE	Land transfer experience
OLS	Least Squares Regression Analysis
2SLS	Two-stage Least Squares Regression Analysis

The Inlfluence of household-level Factors on Farmers' Willingness of Agricultural Land Circulation in China: Based on Survey Data From 28 Provinces

v

Table of Contents

The Influence of household-level Factors on Farmers' Willingness of Agricultural Land Circulation in China: Based on Survey Data From 28 Provinces

vi

List of Figures

List of Tables

The Influence of household-level Factors on Farmers' Willingness of Agricultural Land Circulation in China: Based on Survey Data From 28 Provinces

vii

The Influence of household-level Factors on Farmers' Willingness of Agricultural Land Circulation in China: Based on
Survey Data From 28 Provinces

viii

Chapter 1: Introduction

This chapter elaborates the direction of the full text and explains the research object and purpose. The history of the rural land circulation in China in the past 30 years is briefly introduced, and the importance of the household factor and farmers' willingness to transfer is described, which provided the basis for following chapters to study the influence of household factors on farmers' willingness to land circulation in China.

1.1 Background

1.1.1 China's Social and Economic Development

China's land system has undergone a change process from private to the collective (z. Xie and Wang, 1999). From the Qin Dynasty to the Qing Dynasty (220sBC-1910s), the land system was based on feudalistic authoritarianism. In 1946, the Chinese Communist Party began to push all rural land ownership to farmers, implemented a policy of "cultivators have their fields" and completely overthrew the feudal land system. This reform laid an important economic foundation for the People's Republic of China (y. Liu, 2014). However, given the requirements of the socialist countries, this was only a transitional policy. Later, China's rural land ownership system began to undergo the socialist transformation.

From 1953 onwards, the peasant land ownership system was transformed into collective ownership (Pu, 2010). Because the ownership system and the labor productivity at the time were not commensurate with each other, this institutional arrangement resulted in great destruction of productivity and a significant decline in the standard of living of the people.

After fully realizing the drawbacks of centralization of the village collective, "the household contract responsibility system" was introduced in 1978 which stipulated that rural land was "collectively owned and operated by families". This system at once greatly improved labor productivity, but it also gradually exposed the contradiction between the small-scale peasant economy and agricultural modernization (y. Liu, 2014). Under this circumstance, the transfer of land contractual management rights began to receive attention.

In parallel with the reform of rural land in the late 1970s, was the initiation and development of China's reform and opening up policy. With the increase in the socio-economic impact of the market economy on China, the secondary and tertiary industries have grown rapidly, the demand for labor has increased substantially, and the income of traditional agricultural labor has become less attractive to farmers. In the composition of GDP, agriculture accounted for 27.9% in 1978 and only 8.6% in 2016[1]. From 1978 to 2012, the total income of rural households increased by 119.6 times, and the proportion of agricultural income to annual household income dropped from 94% to 79.5%[2]. In 1978, the rural population in China was 790.14 million, of which the agricultural labor force accounted for 92.4%. In 2016, the rural population in China was 579.93 million, accounting for 59.4% of the agricultural production[3],

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1 Data cited from "China Trade and External Economic Statistical Yearbook, 2017"

2 Data cited from "China Yearbook of Household Survey, 2014"

3 Data cited from "China Rural Statistical Yearbook, 2017"

The Influence of household-level Factors on Farmers' Willingness of Agricultural Land Circulation in China: Based on Survey Data From 28 Provinces

about 40% of the population were living in cities. The transfer of agricultural labor forces has brought about the circulation of rural land.

Rural land circulation is inevitable in agricultural modernization (s. Lv, He, et al., 2017). Rural land circulation is of great significance in China: firstly, it can realize the optimal allocation of resources; secondly, it can promote the development of agricultural economies of scale; thirdly, it can promote the migration of rural surplus labor to cities and realizes the coordinated development of urban and rural economic and social integration (Feng, Huo, et al., 2010a), and promote the process of regional urbanization (Zhou, Yao, et al., 2009).

Most developed countries have established relatively complete legal systems for rural land transactions and have accumulated considerable experience in rural land transactions. Many developing countries are also actively exploring the reform of rural land. Against this background, it is imperative for China to try to develop policies for rural land circulation that suit its national conditions.

1.1.2 The development of policy& right system of rural land circulation in China

The attitude of the Chinese government toward land circulation has gone through three stages.

At first, the Chinese government banned the rural land circulation. The amended Constitution clearly stipulated that the land contracted by the farmers was not allowed to be sold, leased or transferred.

Gradually, the government began to allow land circulation and admitted farmers' rights to benefit from the land transfer. Since 1984, rural land circulation has been allowed. At this stage, the land transfer must be free of charge and farmers were not allowed to obtain circulation income. The "Land Administration Law of the People's Republic of China" passed in 1986 allowed the contracted land to be subcontracted to a third party for free with the collective agreement. The amendment to the "Land Administration Law of the People's Republic of China" passed in December 1988 legalized the rural land circulation and permitted the contracted land to be paid for circulation. In 2001, the CPC Central Committee showed great concern about the rural land circulation to enterprises and individuals outside the village collective (Guo and Su, 2016).

The Chinese government began to encourage rural land circulation. In 2002, the National People's Congress passed the "Law on the Contracting of Rural Land", which clearly permitted farmers' right to circulate outside the village collective. The promulgation of the "Property Law of the People's Republic of China" in 2007 marked the outcome of rural land reforms in which contractual management rights were adjusted from policies to legal adjustments(d. Zhu, Wang, et al., 2014). The "Decision of the Central Committee of the Communist Party of China on Several Big Issues on Promoting the Reform and Development of Rural Areas" promulgated in 2008 clearly stated that it's necessary to establish and improve the market for rural land circulation, which meant that the management rights of contracted rural land could be traded on the market as commodities, and their prices can be determined by the market. In 2013, the "Decision of the Central Committee of the Communist Party of China on Some Major Issues Concerning Comprehensively Deepening the Reform" was adopted, giving farmers the right to possession, use, income, circulate,

and mortgage the contracted land (Guo and Su, 2016). In 2014, the Ministry of Agriculture emphasized the importance of fully understanding the promotion of family farm development and guiding the circulation of contracted land to family farms[4]. In September 2014, for the first time a new pattern of ownership, contract rights, and management rights was clearly proposed[5]. The "Opinions of the General Office of the CPC Central Committee and the General Office of the State Council on Improving the Measures for Separating Rural Land Ownership from Contracted Management Right" were promulgated in 2016, clearly stating that the land ownership, contracting rights, and operating rights should be allocated (LV and Jia, 2017) to improve land circulation. Rural land circulation is not only a solution to rural land abandon, but it also helps in the transformation of agriculture.

The following two figures illustrate the property rights system of Chinese farmland.

Figure 1: Land rights system bfore the independence of land management right

(Wang, C. & Li, J., 2007. Real Right Law of the People. Beijing: Higher Education Press.)

Figure 2: Farmland property rights after the independence of land management right
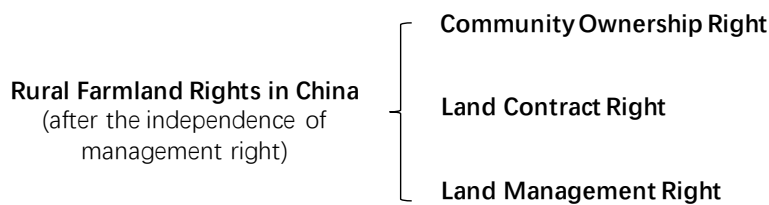
There are many forms of farmland circulation, the most common being transfer, swap, shareholding, and lease. The Chinese jurisprudence classifies transfer, swap, and shareholding as property transfer, and the lease is claimed transfer.

The following table shows the rights of ownership, contracting, and management rights under these four common forms of circulation.

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4 "Guidance on promoting the development of family farms", Issued by the Ministry of Agriculture of China on February 24, 2014

5 "The fifth meeting of the central comprehensive deepening reform leading group" held on September 30, 2014

The Influence of household-level Factors on Farmers' Willingness of Agricultural Land Circulation in China: Based on Survey Data From 28 Provinces

3

Table 1: Farmland rights structure in land circulation

Subject of rights	In the real right transfer			In the claim transfer
	Transfer	Swap	shareholding	Lease
Village Collective Economic Organizations	Land Ownership	Land Ownership	Land Ownership	Land Ownership
Farmer Household	Land contracting right	Land contracting right / Land management right	Land contracting right	Land contracting right / Land management right
Other Agricultural Business Entities	Land management right	Land contracting right / Land management right	Land management right	Leasehold rights to land management right

Village collective economic organizations have always mastered the ownership of agricultural land, which is determined by the public ownership of socialist production materials.

Farmers always have the right to contract farmland. In the case of transfer and shareholding, farmers transfer land management right to other agricultural business entities, keeping only contracting right.

In the case of the swap, both sides have contracting right and management right, just swapping the parcels.

In the case of the lease, farmers also retain contracting and management right, other agricultural business entities obtain leasehold rights of the land management right. From the actual situation of China's agricultural land circulation, 81.3% of farmland is the claim circulation(Xiao, 2018).

1.1.3 The Current Situation and Existing Problems of Rural Land Circulation in China

China's rural land circulation has achieved certain results after more than 30 years of development. The speed of rural land transfer has accelerated, the scale of rural land circulation has been steadily increasing, and more forms of rural land circulation have appeared (z. Cai, 2010a), the mechanism of farmland circulation has been initially established6.

However, there are still many problems, such as institutional problems (incomplete legal system, etc.), the uneven distribution of circulation, the limited circulation, the traditional concept urges peasants value land but do not want to transfer land, the rural social security system is incomplete (Feng, Huo, et al., 2010a), and misconduct of administrative organizations and village self-government organizations (s. Han, 2012a). These important issues in rural land circulation in China are all more or less related to farmers' willingness to circulate because farmers have the rights to contract and operate rural land (Details will be demonstrated in the following chapters). Therefore, the study on farmers' willingness towards rural land circulation may be a perspective to resolve China's rural land circulation dilemma.

6 Cited from Ministry of Agriculture and Rural Affairs of the People's Republic of China, http://zdscxx.moa.gov.cn:8080/misportal/public/dataChannelRedStyle.jsp

The Influence of household-level Factors on Farmers' Willingness of Agricultural Land Circulation in China: Based on Survey Data From 28 Provinces

1.1.4 Land Circulation and Urbanization in China

Urbanization[7] is a combination of economic urbanization, population urbanization, land urbanization, and value urbanization (p. Zhang, 2014). Land circulation has produced profound economic and social impacts on promoting rural development in China and promoting the integration of urban and rural areas. Urbanization has become the strongest driver of China's economic growth and social development in the past decade or so, and the trend of rural land circulation associated with it has also become increasingly apparent (c. Liu and Huang, 2013).

The importance of rural land circulation to urbanization lies in:

Firstly, through land circulation, farmers and migrant workers entering the city are engaged in non-agricultural industries in large numbers and promoted the process of regional urbanization (Zhou, Yao, et al., 2009). Since the founding of the Peoples Republic of China, the urbanization rate was only 10.64%. In order to develop the economy and change the backwardness of the status quo, Chinese governments have chosen to give priority to industries and restricted the flow of rural people to cities. By 1976, the urbanization rate was only 17.44. %. Since the reform and opening up, population movement has been no longer restricted. By 2011, the urbanization rate has reached 51.27%, the urban population has exceeded the number of rural residents for the first time. By the end of 2012, the urbanization rate has reached 52.6% (p. Zhang, 2014), which has reached the average urbanization level in the world. By the end of 2017, China's urbanization rate was 58.52%[8].

Secondly, changes in the concept of the peasants and the increase in the degree of civilization have accelerated the process of urbanization (Xiong and Zhao, 2010). Farmers become willing to work in cities, this has accelerated the circulation of farmland and provided the labor force for the development of the cities.

Thirdly, some agricultural land is converted into construction land, providing a spatial basis for urbanization. From 1990 to 2010, the built-up area of Chinese cities increased from 12,200 km^2 to 40,500 km^2[9], and a large part of the land was converted from agricultural land use.

However, while achieving great economic achievements, the urban-rural structural problems that have plagued China's economic and social development have not only persisted but also become increasingly fierce. Farmers in China, as one of the most massive social groups, make basic contributions to urbanization. However, they cannot meet their interests in the system and even suffer from discriminatory treatment (l. Zhang, 2015). In the process of farmland circulation, this unfairness is mainly manifested in three aspects:

Firstly, income and welfare are extremely unevenly distributed. At present, the transfer price of farmland only considers the value of land as a producer's production capital, ignoring the social security value of land (x. Jiang and Heng, 2011). In the distribution of value-added benefits brought about by the change of land use, local

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7 Urbanization is the integration of economic urbanization, population urbanization, land urbanization, and urbanization of values. The process of transforming agricultural population into the urban population (population urbanization), the process of transforming agricultural areas into urban areas (land urbanization), the process of continuous evolution of industrial structure (economic urbanization), the process of changing the value and lifestyles of rural residents (value urbanization).

8 Data cited from National Bureau of Statistics of China, http://data.stats.gov.cn/swf.htm?m=turnto&id=563

9 Data cited from News China, http://news.china.com.cn/2012-08/27/content_26343605.htm

The Influence of household-level Factors on Farmers' Willingness of Agricultural Land Circulation in China: Based on Survey Data From 28 Provinces

governments and village collectives occupy more than 90% of the benefits, while farmers only occupy 5% to 10% or even less (Jin, 2013).

Secondly, the disparity between urban and rural areas are institutionally distorted. For a long time, China's urban and rural governance is based on different laws, thus forming the dual urban-rural structure in China. Urban residents generally enjoy more social services. Corresponding to this, the social security level is low and its coverage is relatively narrow in rural China. Therefore, social security functions such as employment, pension, housing, education, and medical care carried by the farmland become very important for farmers. In addition, public services like education, medical care, and infrastructure are also heavily tilted toward the cities, and rural public services are scarce.

Thirdly, the number of people who lost land but couldn't successfully integrate into work and life in cities has increased year by year (c. Liu and Huang, 2013). Due to the long-term dual urban-rural structure in China, the current employment capacity of farmers is not high (Jin, 2013), and employment opportunities are limited. The Chinese household registration system and the corresponding limited social services that farmers can enjoy making it hard for landless peasants to live in the cities.

Farmland circulation and urbanization have complex linkages. China's urbanization needs land circulation, but the current phenomenon harming farmers' interests in the process of land circulation strengthens the social security function of the land and weakens the assets' function of the land, and to a certain extent reduces farmers' willingness to transfer land. The low transfer will constrains the speed and efficiency of land circulation(p. Zhang, 2014), which in turn will hinder the process of urbanization.

1.1.5 The Importance of Farmers' Willingness and household-level Factors
Since farmers are an important subject of rural land circulation, farmers' willingness and behaviors have a fundamental impact on rural land circulation (Yue, 2010a).

However, farmers' willingness to circulate land is generally low. Nearly 60% of the farmers were unwilling to "outflow" farmland, and more than 80% of the farmers were unwilling to "inflow". The low willingness of farmers to transfer land was an important cause of the current dilemma of rural land circulation(Ye, 2013a). Studying the influencing factors of farmers' willingness could help us understand the bottleneck of land circulation in China correctly and help accelerate the pace of circulation, alleviate the problem of rural land abandonment and fragmentation and improve the efficiency of rural land use (g. Qin and Xin, 2015).

The family-based self-subsistence peasant economy has lasted more than 2,000 years in China. The impact on Chinese society is enormous and far-reaching. The current rural land system in China determines that the peasant households are still the manager of rural land as well as the decision-making unit (w. Li and Dai, 2014). As a farmer's production and living unit, the family is the basic organization for farmers to participate in social activities. Some scholars have studied the role of family factors in land circulation. Zhu Peixin believed that the family life cycle would affect the household's land management scale and land transfer decision-making. The scale of farmer household land management was "inverted U-shaped" with the evolution of the family life cycle and household' preference for land transfer decisions gradually changes from inflow to outflow (p. Zhu, Yang, et al., 2017). Family endowments in

The Influence of household-level Factors on Farmers' Willingness of Agricultural Land Circulation in China: Based on Survey Data From 28 Provinces

6

rural China had the important influence on individual behavior decisions (y. Yang and Shi, 2012), households with more income and financial assets would choose non-agricultural employment, while households with more cultivated land will choose agricultural production. The family income and its structure had a significant impact on the risk consciousness of household land circulation (Gao and Li, 2015).

1.2 Problem Statement and Provisional Research Questions

According to the data at the end of 2015, the circulated rural land area accounted for 33.3% of the total area of rural land contracted by households in China10. It was a great result of China's implementation of the rural land circulation policy. Still, we should also note that the rural land occupied by Chinese farmers is small and scattered, which is far from enough for scale operation. Land concentration and agricultural scale operation are premised on farmers' positive attitude towards rural land circulation.

As introduced in the background, in view of the important position of farmer's rural land circulate willingness and family factors in the rural land circulation in China as well as current difficulties faced by the land circulation, the main research question and sub-questions are:

Main question: What are the influences of household-level factors on farmers' willingness of farmland circulation in China?

Sub-questions:

No.1 What household-level factors affect the farmers' willingness to circulate rural land?

No.2 How do these factors affect the farmers' willingness to circulate rural land (positive and negative, intensity)?

No.3 What are the differences in the distribution of farmers' willingness to circulate among provinces under study? Why do such differences exist?

No.4 By understanding the important factors at the household-level, what changes can be brought about (legal, policy, administrative, social, economic, etc.)?

1.3 Research Objectives

This study focuses on the household-level, sampling households from 28 sub-national administrative units in China, and tries to explore the impact of household variables on their willingness to circulate rural land：

Firstly, household-level factors that can affect farmers' willingness to circulate farmland.

Secondly, the mechanism by which these factors affect the willingness, the influence trends, and intensity.

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10 Data cited from Ministry of Agriculture and Rural Affairs of the People's Republic of China
http://zdscxx.moa.gov.cn:8080/misportal/public/dataChannelRedStyle.jsp

The Influence of household-level Factors on Farmers' Willingness of Agricultural Land Circulation in China: Based on Survey Data From 28 Provinces

7

Thirdly, the differences in the distribution of farmers' willingness among these sub-national administrative units and the reasons for these differences.

Finally, the changes which can be made to the existing policies or aspects can be taken into account when making new policies to promote farmers' willingness to circulate rural land.

1.4 The Significance of Research

The social significance is that the research may be possible to find important household-level factors that affect farmers' willingness to rural land circulation in China and provide a reference for the government's policy and legislative direction to promote rural land circulation. The study of farmers' willingness to circulate rural land may provide some information for these studies on the limelight and help to explore new directions for rural reforms.

From an academic point of view:

This study uses a nationwide sample, which is more representative, to conduct research. So that this research is more likely to find common factors that have a significant impact on transfer willingness, and the research results can provide useful information to other socio-economic studies in a wider range.

The existing researches on the land circulation willingness to transfer land mainly paid attention to the influence of social, political and economic factors on the transfer willingness. There are few studies on the household lever factors, this research can open up researches on the relationship between household lever factors and transfer intentions. Besides, this study divides household factors into three aspects to make research more comprehensive.

By analyzing the important factors affecting the willingness of agricultural land transfer, this study can summarize the mechanism of these factors acting on the circulation willingness, which can provide an entry point for future policy intervention.

1.5 Scope and Limitations

1.5.1 Scope
This study focuses on the influence of household-level factors on farmers' land transfer willingness and mainly explores which household-level factors can influence the land transfer willingness through what mechanism. Firstly, through the literature review, find the mechanism by which the policies act on the variables; Secondly, test which variables can affect transfer willingness, what is the degree of impact, whether it is positive or negative; Thirdly, find the influence mechanism of these variables on the willingness and propose corresponding policy implications.

The study is divided into five chapters:

The first chapter is the introduction. Introduce the background from both theoretical and practical aspects, introduce the land rights system, the main problems, and the research significance, structure arrangement, possible innovation, and limitation.

Chapter 2 is the literature review which explores the experience of other countries in stimulating farmers' willingness to transfer, Chinese scholars' general research on land transfer and Chinese scholars' research on farmers' transfer willingness (the current

The Influence of household-level Factors on Farmers' Willingness of Agricultural Land Circulation in China: Based on Survey Data From 28 Provinces

8

situation of transfer willingness, existing problems, and factors affecting the willingness to transfer). The important concepts and the framework of this research are also proposed.

Chapter 3 is the research method. The research methods and data sources the variables used in this study, and the limitations of the research methods are discussed.

Chapter 4 is the research results. Through the quantitative regression, find significant variables, test the estimation results, and explain the estimation results based on the actual situation of Chinese society.

Chapter 5 is the summary. The whole research process and results, the influence mechanism of key variables on transfer willingness are summarized and policy recommendations are put forward.

1.5.2 Limitation

This study focuses on the influence of household-level factors on households' willingness to transfer land in rural China, removing other influencing factors such as social factors, economic factors, and legal factors. This may limit the scope of the research, and the explanatory power of the model.

In some existing studies, family income and income sources, the average educational level of the family, etc., were also studied, but these variables were not included in the study due to limitations in database content and the inability to re-collect data.

Although from the questionnaire design to the data collection to the data processing, the professional team has tried to maintain the validity of the data as much as possible, the respondents had the different understanding of survey questions, this led to differences between survey data and reality more or less.

The dependent variable of this study is the binary variable, which generalizes the attitude of households to land circulation as simply "willing" and "unwilling", and ignores the divergence between households' attitude.

In order to make it more convenient for statistics, this study introduces many dummy variables, and the method of categorization is adopted in the setting process of dummy variables. Although the author has tried to reasonably classify the data, these dummy variables still more or less discount the actual situation.

The data collection process is: training students from 28 provinces who volunteer to participate; these students return to their hometowns and randomly select villages in their hometowns, students randomly select households in the village to conduct interviews to obtain data. This method of data collection is efficient, but it also brings a problem: samples are not completely randomized, and sample representation is subject to errors due to accidental factors.

According to the data screening criteria mentioned before, some samples were deleted from this study. In the subsequent modeling, the samples actually used for research were greatly reduced through outliers and extreme value processing. This may affect the representativeness of the sample across the country.

In the endogeneity test, it was difficult to ensure that the instrumental variable is independent of the dependent variables, and the correlation between the instrumental variable and the endogenous variable is weak. There is a risk that the instrumental variable is a weak instrumental variable, which leads to biased estimation results.

The Influence of household-level Factors on Farmers' Willingness of Agricultural Land Circulation in China: Based on Survey Data From 28 Provinces

9

Chapter 2: Literature Review

This chapter gives a brief description of the existing research on farmland circulation. First briefly introduce the experiences of several countries in the trade of rural land, then introduce scholars' research on the rural land circulation in China, finally introduce the research findings of Chinese scholars on farmers' willingness to circulate rural land.

2.1 Land Transaction Experience in Some Countries

The rural land circulation in China is related to the concept of "rural land transaction" which is more widely used in the world. Under China's policy of "Separation of farmland ownership, contracting rights and operating rights", "rural land circulation" refers to the transaction of operating rights of contracted rural land, and does not involve ownership. The "rural land transaction" is widely used internationally as a broader concept, it includes both the transfer of farmland ownership and use rights (d. He, 2014).

Many developed countries have established a mature rural land transaction market. Other countries, including China, are also exploring the use of rural land systems that suit their own national conditions and are striving to achieve efficiency and scale agricultural operations.

This study selects four countries for reference for the following reasons: The United States is one of the pioneer countries of modern land transfer, with a well-developed circulation system and legal system, which has great significance for China's land transfer; Because of the same land system in the history or at present, the land reform experience and problems encountered by the Russia and Vietnam have the significance of warning and enlightenment for the ongoing land reform in China; China and Japan have a high population density and the problem of great land supply pressure, how to improve efficiency and protect cultivated land in the process of effective circulation is an important issue in China, and we can learn from Japan's experience in this respect.

2.1.1 America

American agriculture is the most developed and representative of modern agriculture in the world and occupies a very important position in world agriculture. Farmland circulation in China has only a history of several decades, various systems have not yet been established. It is necessary to refer to the experience of rural land circulation in the United States.

From the founding of the country in 1776 to the beginning of the 20th century, by selling public land through auctions and providing free land for pioneers, the United States opened up the era of land circulation. In particular, the "Homestead Act" promulgated in 1862 made about 2 million people without farmland become farmers(b. Yang, 2015). At the beginning of the 20th century, the United States established an agricultural business model based on the family farms

The land transfer system in the United States is mainly based on market regulation. Since 1820s, public land has been privatized, whether land transfer was between the government and private individuals, or between individuals, it was necessary to follow market rules and transfer land in a compensated manner (Lin, Bao, et al., 2016).

The Influence of household-level Factors on Farmers' Willingness of Agricultural Land Circulation in China: Based on Survey Data From 28 Provinces

10

The main mode of land transfer in the United States was the leasehold system. Landowners were either seeking land users themselves or renting farmland through intermediary agencies. The land rents were mainly fixed land rents and share rents. The land price was determined by agreement between the two parties and they should deal with the registration process together (l. Wang, Huang, et al., 2012). The United States has introduced a series of laws and regulations such as the "Agricultural Improvement and Reform Law," "Land Transfer Law," and "Land Registration Law." These regulations reduced disputes in the circulation process and protected the interests of family farm operators (Lin, et al., 2016).

The land transfer in the United States has the following characteristics: First, clear property rights. The United States has three types of land ownership: private, state, and federal governments (b. Yang, 2015). Except for the fixed land tax, agricultural product sales income tax, and real estate tax in accordance with national and local government regulations, landowners had the right to distribute and dispose of all the land revenue. The federal and state governments only reserved three rights over the land: the right to expropriate land; the right to plan land management; and the right to impose a full land tax. Second, market regulation was the dominant factor. The management of land circulation was mainly carried out through the developed markets and trade principles in the US. Third, the policy focused on promoting land concentration. The government adopted actions such as credit support, policy guidance, interest adjustment, price subsidy and legal means to encourage a moderate expansion of family farms (l. Wang, et al., 2012).

The United States differs from China in land ownership and land use system. China should learn from the experiences of land transfer in the United States to improve the land legal system, establish a healthy land market and limit the role of administrative forces in the process of land transfer.

2.1.2 Japan

Japan is one of the countries with the highest population density in the world. According to the data from the World Bank, the per capita cultivated area in Japan was only 0.03 ha in 2015, while the per capita cultivated area in China was 0.09 ha, which was far below the world average of 0.194 ha[11]. The circulation of farmland was earlier than China and has the problem of shortage of cultivated land, the experience of Japan's land circulation is worthwhile referring to.

After the second World War, Japan promulgated the "Rural land Adjustment Act", which failed to reform due to the retention of a large number of feudal agricultural systems (b. Yang, 2015). In 1952, the "Rural land Law" established a permanent peasant land ownership system from a legal perspective (Lin, et al., 2016). With the acceleration of Japan's economic development, industrialization, and urbanization, Japan has gradually initiated a reform of the land system to promote land circulation and promote agricultural scale management, which could be roughly divided into three stages:

The first stage: Relaxing restrictions on the transfer of land ownership (1961–1969)

In 1961, Japan promulgated the "Rural land Reform Act of Japan", which proposed the development of a more selective way of nurturing more "self-operating farmers",

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11 Data cited from the World Bank, https://data.worldbank.org.cn/indicator/AG.LND.ARBL.HA.PC

The Influence of household-level Factors on Farmers' Willingness of Agricultural Land Circulation in China: Based on Survey Data From 28 Provinces

11

however, it only emphasized the sale of land and restricted land leasing. In 1962, the revised " Rural land Law" relaxed the maximum limit of land area owned by farmers, allowed various agricultural production organizations initiated by farmers to purchase and rent agricultural land, and established a "land trust system" (l. Wang, et al., 2012). However, the effect of these policies was not obvious.

The second stage: Encourage the transfer of land use rights (1970-1985)

By the early 1970s, the Japanese government began to realize that it was very difficult to increase the scale of farmland management by relying on the land ownership transfer among farmers, the idea must be shifted to land use rights and land management rights. In 1970, Japan made a fundamental amendment to the "Rural land Law" promulgated in the 1950s. It fully liberalized the restrictions on land leases, abolished the maximum area restrictions for farmers renting land and the maximum rent for renting land (Huang and Zhang, 2016), so that farmers can freely lease land. Later, reforms such as the pension system for farmers and the "expanded funds for operating scale" were successively formulated. The proportion of rental land in Japan rose from 7.6% in 1970 to 20.5% in 1985 (l. Wang, et al., 2012).

The third Stage: Encouraging land concentration on "consenting agricultural production units" (1986-)

After the mid-1980s, the degree of internationalization and marketization of agriculture continued to increase. The Japanese government believed that in order to increase the competitiveness of agricultural production units, it was necessary to attract competent people and young people to specialize in agricultural operations. Japan has begun to use the "consenting agricultural production units" to replace the development idea of "self-operating farmers". In the 1990s, Japan successively implemented a series of laws, gradually established a land transfer system that was suitable for Japan, promoted the concentration of land and laid a foundation for the scale agriculture (b. Yang, 2015). By providing preferential loans and special fund loans to professional agricultural operators and agricultural corporations, Japan enhanced the efficiency of the land transaction in Japan greatly (Huang and Zhang, 2016).

There were three characteristics of land transfer in Japan. Firstly, special land transfer intermediary agencies were established. The main business of these agencies was to purchase or rent farmland from farmers who were willing to lease farmland, and then to sell or lease the land to agricultural production units. The government also provided financial assistance to the intermediary agencies and tenants. Secondly, prudent treatment of corporations who wanted to take part in farmland circulation. Japan government restricted companies directly entering the agricultural production to avoid the non-agricultural use of agricultural land. Thirdly, implemented supportive policies, such as education, vocational training, agricultural pensions and agricultural associations (l. Wang, et al., 2012).

Land ownership and land use system are different from that of China, but after a series of reforms, Japan's rural land reform has achieved considerable results. Lacking per capita arable land is a common problem faced by China and Japan. China should learn from the experiences and effective measures of arable land protection in Japan in the process of land circulation. China's land reform must also continuously adapt to changes in the world's situation and make corresponding adjustments, just like Japan's.

The Influence of household-level Factors on Farmers' Willingness of Agricultural Land Circulation in China: Based on Survey Data From 28 Provinces

12

2.1.3 Russia

Russia's land system in the Soviet period was just like the public ownership in China now, but it has undergone a series of reforms since the 1990s. Understanding the experience of the land reform process is conducive to the reform of China's land use system.

The Russian rural land system experienced two major reforms (the era of Yeltsin and the Putin era), but the privatization of agricultural development and the farmland circulation for more than 20 years have not produced very good results (z. Wang, 2014).

In 1991, after Yeltsin took office, he promulgated the privatization law, which freed the nation's farms to individuals in the form of "land share". However, such policies only made people nominally landowners, most people didn't really grasp real land rights, making it difficult for the resources to transfer among people. In 1993, the landowner was given the right to sell, mortgage and rent his own land. However, because the corresponding legal, political, and economic conditions were not mature enough, the results of this phase of reform were limited (h. Li, 2017).

After Putin took power, he actively explored the system of free trade in land. In 2002, the State Duma passed the "Agrarian Land Transfer Act," establishing the right to free movement of rural land, but the restrictions on foreign corporations and foreigners were extremely strict (z. Wang, 2014). The amendment to the "Land Code of the Russian Federation" promulgated in 2005 has made land marketization lawful. In 2007, the Russian Duma passed an amendment to the "Law on Rural land Circulation", extending the lease period of land contracts and proposing new rules to simplify farmers' procedures for land rights (Fan, 2010). At present, there have been some achievements in land circulation in Russia, but the results of the reform remain to be seen.

Russia's former land ownership was the same as China's present land ownership system, Russia is now exploring a new road to reform the land system. Although the current reform situation is still uncertain, China should still pay close attention to Russia's land reform and draw lessons from it—— effective measures should be learned and ineffective or even destructive actions in Russia's land reform should be abandoned.

2.1.4 Vietnam

Vietnam is one of the few socialist countries in the world. Like China, land in Vietnam is mainly with public ownership. After the collectivization of agriculture was completed in North Vietnam and South Vietnam in 1954 and 1975, Vietnam's land was with state ownership, collective ownership and individual ownership (only 5% of the land was owned by individuals). Due to the decline in productivity caused by the collectivization of agriculture, Vietnam had been in a food crisis since the 1980s.

In response to the famine, Vietnam began the reform of the land system in 1981. Among all actions, the introduction of the "Land Law of Vietnam" in 1993 was of great significance: it clearly stated that the land was owned by the state, granted farmers long-term land use rights and gave peasants trade rights, lease rights, inheritance rights, mortgage rights and the right to transfer land. It also stipulated the time limit and the allocation of agricultural land. For annual crops and aquaculture, the period of land use was 20 years, for perennial cropland it was 50 years. In the north

The Influence of household-level Factors on Farmers' Willingness of Agricultural Land Circulation in China: Based on Survey Data From 28 Provinces

13

and central regions, the area of annual crops had a maximum of 2 hectares, in the southern provinces this number was 3 hectares. For perennial crops, one can occupy a maximum of 10 hectares in the plains and up to 30 hectares in the central and mountainous regions (Hu and Wang, 2008).

In the revision of the "Land Law of Vietnam" in 1998, 2001 and 2003, the land area quota and its use period were adjusted. The land area occupied by land users could exceed the statutory limit. The maximum length of land rent period could be extended to 70 years. The "Land Law of Vietnam" amended in 2001 granted farmers farmland grant rights, it also granted land as a joint venture capital right for investment (l. Wang, et al., 2012).

In the rural land circulation market in Vietnam, farmers could participate in the negotiation as the subject of equity (t. Chen, 2013), this protected farmers' interests to a certain extent. Some problems have also emerged in the opening up of the rural land use rights market in Vietnam. The main manifestations were the concentration of land ownership to the rich and the impoverishment of landless farmers.

The land ownership systems in China and Vietnam are basically the same, and there are many similarities in the land use systems, both countries are in land reform. China should pay attention to the process of land reform in Vietnam, learn about the good experience of Vietnam's land reform, and pay attention to the problems that Vietnam has because China has a similar system, these problems are likely to recur in China.

2.2 General Research of Farmland Circulation in China

From the late 1980s, scholars began research on the rural land circulation in China. They explored the status and problems of rural land circulation, circulation mechanisms, the distribution of benefits among subjects, factors influencing farmland circulation, and farmers' willingness to circulation.

2.2.1 Current Situation and Problems of Circulation

Because of the development of the market economy and the promotion of the Chinese government, the farmland circulation behavior has become increasingly active, the circulation has been accelerated, and the scale has steadily increased.

By the end of 2013, the circulated farmland nationwide reached 226,670 hm^2, which was 3.1 times of that in 2008, and the ratio of circulation reached 26%, 17.1 percentage points higher than that in 2008 (z. Cai, 2010b). As of the end of 2015, the area of circulated farmland reached 298,000 hm^2, which accounted for 33.3% of the total cultivated land contracted by the family, and the signing rate of circulation contract reached 67.8%. The mechanism for the orderly circulation of contracted lands was initially established[12]. At the end of 2016, of the 230 million rural households that had contracted land in China, nearly 70 million farmers had circulated part or all of their management rights (h. Zhang, 2017).

Scholars also found problems in rural land circulation. The general level of rural land circulation in China is low, the degree of voluntary circulation has declined, the government's guidance and management have not played a full role, and farmland

12 Data cited from Ministry of Agriculture and Rural Affairs of the People's Republic of China
http://zdscxx.moa.gov.cn:8080/misportal/public/dataChannelRedStyle.jsp

The Influence of household-level Factors on Farmers' Willingness of Agricultural Land Circulation in China: Based on Survey Data From 28 Provinces

14

administrative adjustments have occurred (Qian and Ji, 2016), farmland circulation lacked effective policies and financial support. Except for some developed provinces, most of the rural land circulation markets have not developed (Feng, Huo, et al., 2010b). The circulation price lacked market guidance, and the type of property rights in the transaction was limited; the market supply and demand of farmland were seriously uneven, and the rural land circulation market information was asymmetric (Zeng and Li, 2017). The construction of rural land circulation system lagged behind, lacked intermediary service agencies, and the social service system was not strong; circulation operations were not standardized; a large number of rural land was dedicated to non-agricultural construction land; and there were hidden dangers of food security and cultivated land protection (Du, 2010), and the income distribution of rural land circulation was not reasonable (Che, 2004).

2.2.2 Farmland Circulation Mechanism

2.2.2.1 Trading mechanism

At present, the farmland circulation patterns adopted in China include the free circulation mode between actors, the village collective-dominated mode, and the market intermediary organization-dominated mode. Transaction cost various among different modes (z. Yang, 2014). The collective-dominated mode showed obvious advantages in terms of rural land operation scale, contractual stability, and crop structure adjustment (j. Zhang and Zhu, 2017). However, due to the corruption problems of the village collective organizations and the lack of professionalism in all aspects of the land circulation work, various risks in the process of circulation were increased (x. Wu, 2013). The transaction costs of rural land were high, the transaction costs among circulation subjects were unevenly distributed, and the people inflow farmland bore an excessively high proportion of transaction costs, which in turn suppressed the demand (z. Yang, 2014). Compared with other land transfer models, the farmer cooperative-dominated model has the advantage of saving transaction costs, procedural regulations, and mitigating risks (l. Li, 2018).

2.2.2.2 Contract mechanism

Rural land circulation contract included an oral contract and written contract. There were a few transactions that have signed a standard contract, because, in rural China, the verbal contract can self-compact because of trust mechanism, reputation mechanism, future value mechanism and the role of self-punishment mechanism (Hong and Gong, 2015). Therefore, we should not blindly negate non-standardized oral contracts but should safeguard the social mechanisms for their effective operation (s. Xie and Zhou, 2013).

2.2.2.3 Price mechanism.

There are mainly two kinds of pricing mechanisms in rural China: spontaneous transfer price between actors and villager-committee intervention pricing.

Spontaneous transfer prices were generally low. Firstly, the inflow-households were generally small-scale farmers and couldn't afford high rents. Secondly, the scale effect of land circulation couldn't be revealed until a few years later, which made the determination of transfer prices difficult (h. Liu and Liu, 2013). Thirdly, the impact of

The Influence of household-level Factors on Farmers' Willingness of Agricultural Land Circulation in China: Based on Survey Data From 28 Provinces

15

rural ethics on transfer prices, both sides of the transaction usually had long-term, stable relations, the circulation price between acquaintances was usually low.

The large-scale land circulation was usually promoted by the government and the villagers' committees, administrative power played an extremely important role in the formation of transfer price (Tian and Chen, 2013). The reasons why the villager's committees and local governments involved in the determination of transfer prices were: firstly, to protect the rights and interests of farmers; secondly, to balance the interests of all parties; finally, to realize their own interests, the promotion of land circulation was not only an achievement of the government, but also an important means for the governments to obtain benefits.

Land transfer prices should be determined by supply-demand and through market competition (Zeng and Li, 2017). However, there was a serious shortage of intermediary agencies for rural land transfer services in China, and no circulation prices that reflect the laws of the market have been formed. In view of this status quo, some scholars have suggested that the land circulation price mechanism should include three parts: service mechanism, formation mechanism, and supervision mechanism.

Establish three levels of price formation mechanisms, including independent pricing of household, assessment prices of intermediary agencies, and government guidance prices. Farmers determine the prices based on the specific conditions of their land; the agency comprehensively considers various factors and assess the price of a piece of land at a certain point in time; the government determines a guiding circulation transfer price and provides a reference for land transfer prices. The government should also pay close attention to the changes of land circulation prices, and deal with price fraud, strengthen market price supervision (p. Liu, Wang, et al., 2011).

2.2.3 Entities and Distribution of Benefits

There are four major participants involved in the process of rural land circulation in China: farmers, agricultural business entities, village collectives and local governments (z. Wu, Zhang, et al., 2011).

Farmers are the actual occupants of agricultural land and are the main suppliers of circulated land. However, due to the limitations of their own capabilities and ability to maintain their own rights as well as low bargaining ability (y. Li and Yang, 2014), farmers were vulnerable to the guidance and enforcement of administrative forces, they were often in the passive position and needed external support and encouragement (z. Li, 2013).

The villagers' committees were the owners of rural land, enjoyed the supervisory (Duan and Huang, 2008) and auditing rights during the process of farmland circulation, and played the dual role of the trustee and the agent, and assumed dual responsibilities (f. Li and Lan, 2014).

Local governments are designers of land transfer rules and provided various services for other participants. Due to financial pressure and interests, local governments may demonstrate mandatory and selective policy implementation in the process of agricultural land transfer, change the agricultural use of agricultural land, violate the wishes of farmers (y. Li and Yang, 2014), and infringe farmers' land rights and interests (j. Zhang, Wang, et al., 2017).

The Influence of household-level Factors on Farmers' Willingness of Agricultural Land Circulation in China: Based on Survey Data From 28 Provinces

16

Agricultural business entities were the main body of demand for rural land circulation, which has changed from family-owned farms in the early stages of reform to the coexistence of various entities represented by family farms, large-scale agricultural specialized farmers cooperatives, and agricultural enterprises (y. Li and Yang, 2014).

Compared with farmers, the demand body (agricultural enterprises, large grain producers, etc.) often occupied an advantage or a dominant position in the process of land circulation in terms of economic strength, negotiating ability, and psychological factors, they usually control the pricing rights (Xiong and Zhao, 2010). Besides, with the rent-seeking and administrative rights of local governments and villagers' committees, farmers' rights were hardly guaranteed. In view of this, the research on the distribution of interests among different players mainly focused on the loss of farmers' rights, which mainly included farmers' economic rights, political rights, and social security rights (Ying, 2014).

There were two aspects of the economic rights: the low circulation price and the small share of circulation income obtained by farmers. local governments obtained the most revenue, accounting for 60% to 70%, and villagers' committees accounted for 25% to 30% and farmers only accounted for 5% to 10%, or even less. In the past 30 years, farmers lost about 15 trillion yuan (¥) in land circulation and requisition, and only received about 5% of the total compensation (Jin, 2013).

Farmers' political rights involved in the land circulation included the rights to participate in the collective management of the village, the right to participate in land circulation, the right to circulate farmland freely, and the right to contract farmland(Ying, 2014).

Rural land in China was not only the most basic production factor for farmers, but also carried many social security functions such as employment, retirement, housing, education, and medical care for farmers. Losing land by farmers meant not only losing a stable and reliable source of livelihood but also losing a series of social security rights that were loaded on the land (x. Jiang and Heng, 2011).

2.2.4 Constraint Factors of Farmland Circulation

There were six major factors that restricted the effective farmland circulation of in China.

First, high transaction costs. Due to the fixed nature of the land, the issuance and trade were generally limited to a certain area. Together with unstable land rights and low efficiency of intermediary organizations (z. Cai, 2010b), asymmetric information could be found between entities, both parties of the transaction had to pay a huge amount of cost to collect information (Feng, et al., 2010b).

Second, there was a large gap between the expected circulation prices of transferors and transferees. The gap was due to the different utility, the transferors were concerned about the effectiveness of the four aspects namely food security, increasing income, maintaining employment, and social security brought about by land. While the transferees were only concerned about the increase in income (p. Liu, 2017).

Third, the legal mechanism of rural land transfer was not sound. The property rights of rural land were incomplete (Feng, et al., 2010b), commercialization and marketization have not yet been established (Zeng and Li, 2017). Many legal provisions were too general and lacked maneuverability, which led to the spontaneous,

The Influence of household-level Factors on Farmers' Willingness of Agricultural Land Circulation in China: Based on Survey Data From 28 Provinces

17

blindness and randomness of rural land transfer, disputes and torts occur from time to time (z. Cai, 2010b).

Fourth, farmers' willingness to transfer was low. There were three main reasons. Firstly, peasants lack understanding of relevant policies and had a high degree of dependence on land (Feng, et al., 2010b). Secondly, large compensation for land expropriation allowed farmers to see the greater potential value and economic benefits of the land, which reduced the transfer enthusiasm (z. Cai, 2010b). Thirdly, as was introduced in the previous section, the insurance function of the land prevented farmers from rushing to transfer land.

Fifth, financing difficulties hindered the process of farmland circulation. Scale-operations required relatively large capital investment. However, there were fewer loan guarantee units for peasant households, and mortgage loans for land use rights are still subject to many restrictions (z. Cai, 2010b).

Finally, the misconduct of local governments and villager' committees had damaged the interests of farmers. They often carry out illegal activities for their own benefits (like forced farmers to transfer contracted land) (s. Han, 2012b) . Besides, some cadres had insufficient understanding of the importance of appropriate scale operation through land circulation and paid insufficient attention, inadequate guidance and coordination services.

2.3 Existing Researches on Farmers' Willingness

Farmers, as one of the main actors of agricultural land management, were the suppliers and demanders in rural land circulation. Their willingness and behavior have a fundamental impact on the farmland circulation. Farmers' attitudes toward land circulation directly affect the efficiency of farmland circulation (Yue, 2010b). Studies about the influencing factors of farmers' willingness would help to understand the bottleneck of agricultural land circulation in China correctly, help accelerate the agricultural land circulation, alleviate the problems of agricultural land reclamation and fragmentation, increase the efficiency of agricultural land use (Qing and Xin, 2015).

2.3.1 Willingness various in different regions
The development of rural land circulation market not only affected the overall scale of land transfer in the region but also was the root cause of the different scales of circulation in different regions and the evolutionary differences in circulation methods. And the regional difference of this effect was obvious (y. He and Luo, 2012). Farmers' willingness to transfer land in the eastern, central and western regions gradually decreased and circulation willingness in developed eastern regions was stronger than in the central and western regions (h. Chen, 2015a). At the same time, some new features have emerged: the overall willingness to transfer was stronger, the circulation income requirements have continued to increase, and the requirements for management services at the local level has gradually increased (m. Xu, Lu, et al., 2012).

2.3.2 Low overall willingness & mismatch of supply and demand willingness
Although farmers' attitudes toward land transfer vary across the country, in general, Chinese farmers' enthusiasm for land transfer is not high. The Chinese scholars' Yue

The Influence of household-level Factors on Farmers' Willingness of Agricultural Land Circulation in China: Based on Survey Data From 28 Provinces

18

analyzed the statistics of 1032 households in 30 villages in 10 provinces and found that the farmer's willingness to transfer farmland was generally at a low level (Yue, 2010b). A large number of farmers did not want to achieve land circulation. Among the farmers who had the intention to transfer land, the proportion of farmers who had the willingness to become transferors was obviously higher than that of farmers who had the willingness to be transferees. This situation was an important cause of the solidification of rural land circulation (Ye, 2013b).

The willingness of land demanders depended mainly on whether inflow land could bring greater economic benefit (Zhou and Yin, 2015). The main reasons why rural households were unwilling to inflow land included lack of labor force, low crop yield, lack of good production and projects, and information asymmetry. The family's cultivated area was inversely proportional to the willingness to inflow land. Farmers whose agricultural income was greater than non-agricultural income were more willing to inflow land (Hong and Gong, 2015).

The willingness of farmers to outflow land was mainly determined by the benefits of land transfer and the economic risks it bears (Zhou and Yin, 2015). The peasants' ideology of clinging to the land was deeply rooted (x. Han and Tian, 2012) and unwilling to give up farmland. Compared to the temporary transfer, the number of peasants who were willing to permanently outflow their arable land was significantly lower (l. Yang, Li, et al., 2013). Other reasons included the lack of other job skills, low transfer income (Hong and Gong, 2015), rural social security (Ye, 2013b), non-agricultural income (q. Li and Zhang, 2010).

2.3.3 Farmers' willingness was not respected

An important reason for the general low transfer willingness is that the farmers' wishes and interests are not respected or even violated. Some scholars believed that farmers' willingness were often ignored and threatened by local governments and villagers' committees in the process of land circulation in China —— although the government-dominated or villagers' committee-dominated circulation did not necessarily infringe the interests of rural households. For farmers who were reluctant to transfer land, the government's (villagers' committee) behavior might be a potential threat (h. Zhang, 2010).

Due to the lack of assessment mechanisms for agricultural land circulation, the transfer price was basically guided by governments or the village collective economic organizations. The circulation mode and pricing mechanism violated the willingness of the farmers in a certain sense because the dominant nature of the villagers' committee determined the extent to which they can participate in the profit distribution of land circulation. Due to the asymmetric information between farmer households and villagers' committee, there was no effective balance mechanism, many aspects of the transfer did not respect farmers' willingness (d. Han and Han, 2012).

2.3.4 The willingness of land circulation under different theoretical perspectives

In order to explore the formation mechanism of transfer willingness, Chinese scholars have put forward different views.

The Influence of household-level Factors on Farmers' Willingness of Agricultural Land Circulation in China: Based on Survey Data From 28 Provinces

19

Concurrency and willingness to transfer land. Jiang Li divided rural households into three types: purely rural households that were fully engaged in agricultural production, concurrent households that engaged in both agricultural and non-agricultural production, and non-agricultural households that are fully engaged in non-agricultural production but still owned farmland. The study found that the willingness of pure farmers to inflow land was strong. The longer the concurrent households engaged in non-agricultural industries, the greater willingness to transfer land. The non-farm households were much more willing to transfer their land (l. Jiang, 2011). Similarly, Zhang Mingzhong found that households with the high degree of concurrent occupation had a strong willingness of land circulation (z. Zhang and Qian, 2014).

Economic rationality in rural land circulation. Yin Zhiyang analyzed the family's willingness to transfer land from the perspective of the theory of planned behavior. He believed that the family's attitude towards land circulation was based on the judgment of their own earnings (Yin, Cheng, et al., 2012). Qin Wen found that farmers were rational, and the choice of farmland circulation might be based on four preconditions: direct benefits could be obtained through land transactions; expected gains would be stable and higher than that of agricultural land could be obtained; transaction costs were low enough; the personality of and the background features of the farmers were conducive to making the decision to transfer the land (w. Qin, 2012). Li Qiyu believed that as an independent economic entity, pursuing utility maximization was an inevitable choice for rural households (q. Li and Zhang, 2010).

A bounded rational view. The ultimate manifestation of land circulation willingness demonstrated by farmers was the result of the game between risk and profit. Farmers often overestimate low-risk events and underestimate high-risk events, reflecting the limited rationality of farmers' risk perception. Affected by this, peasant households were pursuing profit maximization with minimal risk, while overlooking non-economic profit maximization (g. Qin and Tan, 2013), this case reflected the limited rationality of farmers pursuing profits.

The perspective of land value. Agricultural land has market value and non-market value. The transfer of agricultural land only realized the market value and cannot achieve the non-market value. This was the main reason why some rural households had a weak willingness to transfer farmland (y. Jiang and Xu, 2015). The non-market value of agricultural land included social security value, the identity value, instrumental value, and emotional maintenance value. Farmers' willingness to transfer agricultural land depended to a certain extent on whether the non-market value of agricultural land was realized.

Farmland circulation willingness and endowment effect. The endowment effect means that once an individual owns an item, his evaluation of the value of the item will be greatly increased. Farmers had a strong emotional dependence on farmland so that they had a strong "avoidance of loss" mentality. This special emotion has caused farmers to have a strong endowment effect in the process of land circulation. The higher the endowment effect, the smaller the farmers' willingness to participate in the circulation (t. Chen, Sun, et al., 2014). Research by Han Xiaoyu also proved that farmers' willingness to transfer land was highly correlated with farmers' land dependence (x. Han and Wang, 2013).

The Influence of household-level Factors on Farmers' Willingness of Agricultural Land Circulation in China: Based on Survey Data From 28 Provinces

20

2.3.5 Factors Affecting Farm Households' Willingness to transfer Land

By synthesizing the existing researches on the factors affecting farmers' willingness to transfer land, there are five types of influencing factors:

2.3.5.1 household-level factors

Firstly, household population and family population structure (p. Zhu, Jin, et al., 2011) had a significant effect on farmers' willingness. Parergon is the main reason why farmers were willing to outflow farmland (z. Zhang and Qian, 2014). Households with high non-agricultural employment rate (p. Zhu, et al., 2011, y. Liu and Qiu, 2011, z. Wang, Liu, et al., 2014) had higher land outflow than those who mainly engage in agriculture (Yue, 2010b, Ye, 2013b). Non-agricultural skills(h. Li, Li, et al., 2017, w. Liu, 2011) also had a significant positive impact on farmers' willingness to transfer farmland. The more people the family needs to support, the more the household tend to circulate out of farmland. This is because, for farmers, the difference between the input-output ratio is huge compared with the non-agricultural industry. Therefore, the household with a high dependency ratio is more willing to give up agriculture and engage in higher-income non-agricultural industries(p. Zhu, et al., 2011).

Secondly, the trait of the head of the household played a key role in the decision of the household to make a transfer farmland. farmers with higher education level (z. Wang, et al., 2014, w. Liu, 2011, l. Cai, Duan, et al., 2013, h. Li, et al., 2017, h. Chen, 2015a, h. Chen, 2015b) were more willing to transfer land. Age (z. Wang, et al., 2014, l. Cai, et al., 2013, w. Liu, 2011, h. Li, et al., 2017) and health condition of the householder also affected households' willingness of land circulation. Older farmers not only had a weaker willingness to inflow land (Yue, 2010b), but also had less willingness to outflow land, and the poorer health status of the farmer could weaken the land inflow willingness (Ye, 2013b). Gender (w. Liu, 2011) marital status (h. Li, et al., 2017) were also important factors, male farmers' willingness to outflow their land was stronger than that of women (Yue, 2010b). Due to the low income of migrant workers and the high cost of living in urban marriage, housing, and children's education, migrant workers have placed their emphasis on rural land, thus reducing the willingness to transfer land(h. Xu, Guo, et al., 2012). Unmarried farmers have a stronger willingness to transfer land than married farmers(z. Chen, Ma, et al., 2014).

Thirdly, land use characteristics of the household. land circulation experience (l. Cai, et al., 2013) and the family's class position in history also had heterogeneity in the impact on land circulation willingness. For farmers who had participated in land circulation, the impact of whether they were willing to transfer land again was heterogeneous. Farmers with low status in the ancestral class may be more inclined to hold farmland. The ratio of the total land area of the family to the managing area has a significant positive impact on the per capita income of the labor force and the per capita planting income of the labor force. The larger the value, the more favorable it is to modern agricultural equipment investment, which could improve production efficiency, farmers' income(x. Han, Zhang, et al., 2015) and reducing the willingness to circulation.

2.3.5.2 The ownership of circulation rights

The right to decide rural land circulation and the understanding of rural land property owners (w. Liu, 2011) affected the willingness of land circulation in rural areas. The degree of protection of land disposal rights was the dominant incentive that affects

The Influence of household-level Factors on Farmers' Willingness of Agricultural Land Circulation in China: Based on Survey Data From 28 Provinces

21

farmers' willingness to transfer land. Land income right has a significant positive effect on the willingness of inflow farmland (h. Chen, 2015a).

2.3.5.3 Operational factors in circulation

The trading price of farmland (z. Wang, et al., 2014), the number of years households expected to transfer farmland, the processing time of land circulation procedures, the form of land transfer contract, the degree of understanding of the intermediary organizations and the relevant laws (l. Cai, et al., 2013, y. Liu and Qiu, 2011), the standardization of land transfer (h. Li, et al., 2017), and the role of the villagers' collective (p. Zhu, et al., 2011), these were all important factors that affect farmers' willingness to transfer farmland.

2.3.5.4 Social factors

The higher the level of regional economic development (z. Wang, et al., 2014, w. Liu, 2011, Yue, 2010b, y. Liu and Qiu, 2011), the stronger the farmers' willingness to trade their land. Households with a strong dependence on the social security of land were reluctant to outflow land (w. Liu, 2011, h. Li, et al., 2017, Yue, 2010b), those who enjoyed more social insurance were more willing to trade land (Ye, 2013b). Households with higher Engel coefficients (y. Liu and Qiu, 2011) tended not to transfer land.

2.3.5.5 Geographic factors

The terrain in which the farmland was located had an impact on the willingness to transfer, Ye found that plain residents do not want to circulate their land (Ye, 2013b). However, some studies have concluded that plain residents had the greater the willingness to land inflows (Yue, 2010b). There was a significant negative correlation between the quality of arable land and households' willingness to transfer land (z. Wang, et al., 2014). Land with better traffic convenience (y. Liu and Qiu, 2011) was more likely to be transferred.

There are many factors that inhibit farmland circulation in China, and these factors must affect farmers' decisions through "willingness". As the most direct factor influencing the decision of circulation, the household's wish is worthy of in-depth study.

2.4 Conceptual Framework

2.4.1 Meaning of Concepts

Table 2: Definition of the concepts

Concept	Definition
Urbanization	Urbanization is the integration of economic urbanization, population urbanization, land urbanization, and urbanization of values. It is the process of transforming agricultural population into the urban population (population urbanization), the process of transforming agricultural areas into urban areas (land urbanization), the process of continuous evolution of industrial structure (economic urbanization),

The Influence of household-level Factors on Farmers' Willingness of Agricultural Land Circulation in China: Based on Survey Data From 28 Provinces

22

	and the process of changing the value and lifestyles of rural residents (value urbanization). Population urbanization and land urbanization reflect the increase in urbanization "quantity", while economic urbanization and urbanization reflect improvement of urbanization "quality". The demand for land resources is the material basis and space carrier for urbanization (p. Zhang, 2014).
Rural land	Rural land used in this research refers to all contracted cultivated land, forest land, grassland and other land used for agricultural production collectively owned and used by farmer collective (**The Law on the Contacting of Rural Land**, 2002) .
Contractual operation right of rural land	It refers to the rural collective economic organizations members' right to legally contract collective rural land for a long period of time. As rural contractors, farmers enjoy long-term and guaranteed rights to possess, use, benefit, and dispose of rural land. At the same time, they must undertake the corresponding obligations. The contract for land contractual management rights shall be terminated if contract termination, irresistible factors, and failure to inherit (**The Law on the Contacting of Rural Land**, 2002) .
Land circulation	Under the premise of effective rural land contracted management right and without changing the rural land ownership as well as agricultural use of land, farmers that have enjoyed the rural land contracted management right could transfer contracted land to the transferee voluntarily and legally by subcontract, rent, exchange, transfer, equity, etc., and gain proceeds (Lang, 2010). There are currently 12 kinds of circulation ways: subcontracting, transferring, renting, swapping, stocks, outsourcing farming, auctions, mortgages, land trusts, contract after rent, inheritance, and gifts (z. Cai, 2010b).
Farmers' willingness to land circulation	It refers to the subjective desire of farmers who want to flow in/out of or maintain the current scale of agricultural land through agricultural land circulation (z. Zhang and Qian, 2014).

2.4.2 Conceptual Framework

Figure 3 shows the conceptual framework of this study.

China's rural land transfer is due to the development of urbanization. Urbanization is the cause, purpose, and environment of agricultural land transfer.

As mentioned in the background, contractual operation rights of rural land have been divided into contractual rights and operation rights, which has brought legal basis to land circulation. Households play an important role in land transfer, so household-level factors have an important impact on the households' transfer opinion. There are four main household factors, namely, the household population structure, the traits of the head of the household, the decision mode and the stability of the household, the land use characteristics of the household, which have a positive or negative impact on the transfer willingness. The household's transfer willingness affects the land circulation, which in turn affects the urbanization process.

The Influence of household-level Factors on Farmers' Willingness of Agricultural Land Circulation in China: Based on Survey Data From 28 Provinces

23

As the background, urbanization affects the willingness of households through the regional urbanization level.

Figure 3: Conceptual Framework

The Influence of household-level Factors on Farmers' Willingness of Agricultural Land Circulation in China: Based on Survey Data From 28 Provinces

24
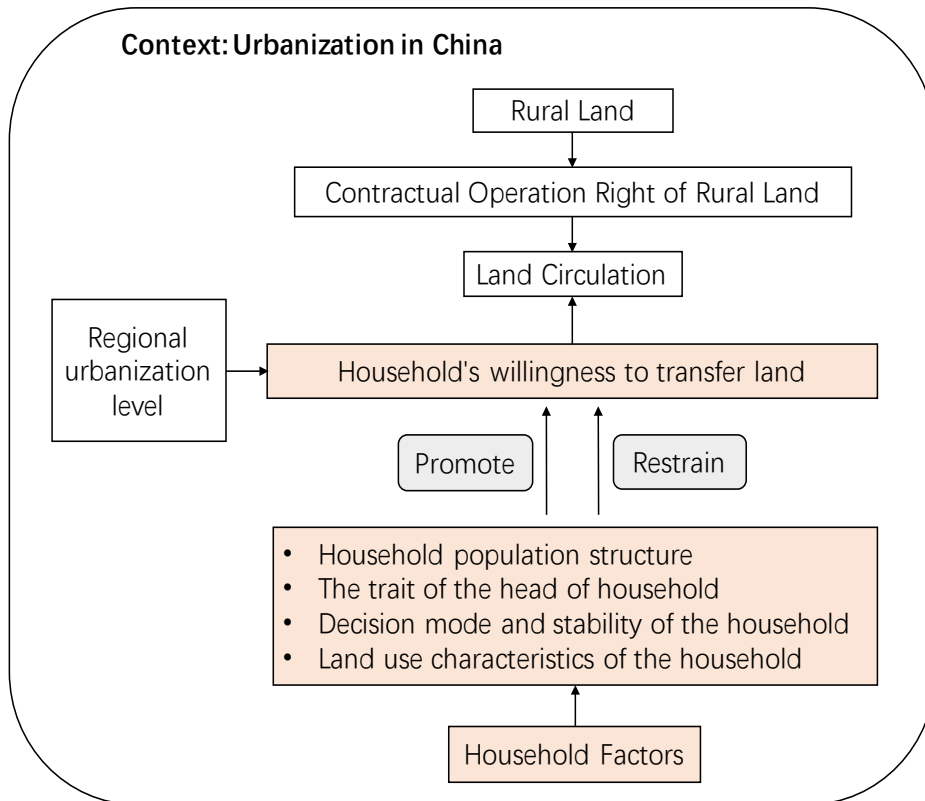
Chapter3: Research Design and Methods

This chapter mainly describes the operationalization and research design that are used to answer the research question. It lists the variables, introduces the research strategy, data collection methods, the sample size of the study and the data analysis method.

3.1 Revised research questions

Through the literature review in the previous chapter, we can find that scholars have conducted systematic research on various aspects of rural land circulation in China. Regarding the factors that affect the willingness of farmers to transfer farmland, scholars mainly conducted research from four perspectives: household factors, circulation rights, social factors and geographic factors. This study will narrow the scope of research and focus on the impact of household-level factors on households' willingness to transfer land.

The main research question is：

In the rural land circulation in China, what kind of household-level factors will affect the farmers' willingness to transfer land in which way these factors work?

Sub-questions derived from the main question are:

No.1 What household-level factors affect the farmers' willingness to circulate rural land?

No.2 How do these factors affect the farmers' willingness to circulate rural land?

3.2 Variables and indicators

As mentioned in chapter 2, household-level factors that can affect households' willingness to transfer farmland mainly include three aspects: household population structure, the trait of the head of household, and land use characteristics of the household. According to the literature and my research on the land circulation, I selected several indicators for each of the three aspects:

Firstly, household population structure: "Non-rural residence ratio", "Agricultural labor ratio" and "Family dependency index";

Secondly, the trait of the head of household: "Age", "Martial", "Health";

Thirdly, land use characteristics of the household: "Actual managing area ratio", "Land transfer experience".

Except these three aspects, I think that the "decision mode and stability of the household" is another important household-level aspect that affects households' decision on land circulation. The decision-making model of Chinese households' family is evolving from "Male has the final say" to a "Negotiation" model. The deep root of this evolution is farmers' economic rationality(Shi and Zhang, 2003). The decision of land circulation depends on this rationality. The foundation of family strategy deeply affects the changes in the structure and function of the family itself. Therefore, I also included the "Family decision mode", "Family conflict type" and "Conflict frequency" into the scope of the study.

In view of the important role of the village collective in land circulation, and the resources and power the village collectives have (as mentioned in chapter 1 and 2), I

The Influence of household-level Factors on Farmers' Willingness of Agricultural Land Circulation in China: Based on Survey Data From 28 Provinces

25

think it is an important variable that could affect the household's decision. Some scholars have studied this variable (whether the farmer has been a village cadre) before, but the results were not significant(Fu, Ji, et al., 2016). In this research, I want to further study this indicator has an influence on the willingness of households to transfer their land and incorporate it into the characteristics of the head of the household.

The agricultural land circulation is inseparable from urbanization in China, so this study also introduces the "urbanization rate of the county where the village is located" as a control variable. Another control variable is the location of the village. As mentioned in the literature review, the geographic factor is also an important factor that influencing farmers' circulation decisions.

There are 10 variables that the database originally contains: "Transfer willingness", "Urbanization rate", "Village location", "Age-head", "Martial-head", "Health-head", "Village cadre-head", "Family decision mode", "Family conflict type" and "Conflict frequency".

Five variables are generated from the indicators in the database:

Table 3: New generated variables

Variable	Generation method and explanation	
Non-rural residence ratio	Method	"number of family members who don't live in rural areas most of the time" / "the total household population"
	Meaning	Measuring the percentage of family members who don't live in rural areas most of the time. It reflects the extent to which households are separated from rural life. The closer the value is to 1, the more family members have left rural life and integrated into the city; the closer the value is to 0, the more family members are still living in the countryside.
Agricultural labor ratio	Method	"agricultural labor force"/ "actual labor force"
	Meaning	Measuring the proportion of agricultural labor in the total labor force of the household, reflecting the degree of household dependence on agriculture. The closer the value is to 1, the more family labor is engaged in agricultural production, and the family's dependence on agriculture is higher; the closer the value is to 0, the more the family labor force is engaged in other industries, and the family's dependence on agriculture is lower.
Family dependency index	Method	("the total household population"-"actual labor force") / "the total household population"
	Meaning	Measuring the family's support pressure. The closer the value is to 1, the more people in the family can support themselves, and the smaller the proportion of people who need to be supported; on the contrary, the closer the value is to 0, the more people in the family need to be supported by others.

The Influence of household-level Factors on Farmers' Willingness of Agricultural Land Circulation in China: Based on Survey Data From 28 Provinces

26

Actual managing area ratio	Method	"actual managing area" / "contracting area"
	Meaning	Measuring households' utilization of contracted land and their dependence on agriculture. The closer the value is to 1, the more contracted land is cultivated by the farmer; the closer the value is to 0, the more contracted land is abandoned or transferred by the farmer.
Land transfer experience	Method	Obtained through the "outflow land area" and "inflow land area". As long as the value of these two indicators was greater than 0, the value of "Land transfer experience" is 1.
	Meaning	Indicating whether the household has land transfer experience. If the value is 0, indicating no land transfer experience. If the value is 1, indicating with land transfer experience.

The following table represented the operationalization of the conceptual framework and show the variables, indicators used to answer the research questions.

The Influence of household-level Factors on Farmers' Willingness of Agricultural Land Circulation in China: Based on Survey Data From 28 Provinces

Table 4: Variables and indicators

Concept	Variables	Abbreviations	Explanation	Type	Values
Household's willingness to transfer land (Y)	Transfer willingness	TW	Household' willingness to transfer land	Categorical	1=unwilling; 2=willing
Regional urbanization level (control variable)	Urbanization rate	UR	County urbanization rate	Continuous	
	Village location	VL	village 's location	Categorical	1=City-rural integration area; 2=near cities; 3=near towns; 4=far from cities/towns
Household population structure (X1)	Non-rural residence ratio	NRR	Percentage of family members who do not live in rural areas most of the time	Continuous	Number of family members who do not live in rural areas most of the time / total population
	Agricultural labor ratio	ALR	The percentage of agricultural labor to total labor	Continuous	Agricultural labor force / total population
	Family dependency index	FDI	Family dependency index	Continuous	Dependent population / total population
Trait of the head of household (X2)	Age-head	AH	Age of the head of the household	Continuous	
	Martial-head	MH	Marital status of the head of household	Categorical	1 = unmarried; 2 = married with spouse; 3 = divorced; 4 = widowed
	Health-head	HH	Health condition of the head of the household	Ordered categorical	1 = healthy; 2 = chronic disease; 3 = serious illness; 4 = disabled and mentally disorder
	Village cadre-head	VCH	Experience of the head of household has been a village cadre	Categorical	0=No；1=Yes
Decision mode and stability of the household (X3)	Family decision mode	FDM	Family decision mode	Categorical	1=One person has the final say；2=family consultation
	Family conflit type	FCT	Family conflit type	Categorical	1=basically no；2=couple relationship； 3=the employment of family members; 4=economic problems; 5=children's education；6=support the old； 7=belif；8=life trivia；9=chlidren's marriage；10=other
	Conflict frequency	CF	Family conflict frequency in one year	Ordered categorical	1= basically no； 2=1 time； 3=2-3 times； 4=more than 3 times
Land use characteristics of the household (X4)	Actual managing area ratio	AMAR	The proportion of the actual managing area to the total area of the household contracted land	Continuous	Actrual managing area / contracted land area
	Land transfer experience	LTE	Land transfer experience	Categorical	0=No；1=Yes

The Influence of household-level Factors on Farmers' Willingness of Agricultural Land Circulation in China: Based on Survey Data From 28 Provinces

3.3 The policy-variables affect mechanisms

Village location, the age of the head of the household, the martital condition of the head of the household can't be influenced by policies, other factors could be more or less affected by the policies or policy instruments:

The urbanization rate varies widely across China, depending on factors such as geography, history, resources, policies, and the economic environment in which the region is located. The government's guide policy, the choice of policy instruments, and whether local governments can develop plans that are appropriate for regional development can affect the urbanization rate of the region.

The non-rural residence ratio and the agricultural labor ratio are closely related to the urbanization rate, the agricultural modernization rate, the regional industrial distribution, and the career view of the local residents. Regional economic policies will affect the distribution of resources in different industries, thus affecting the proportion of employees in different industries. The government adopts policies to train farmers' new labor capabilities and increase employment opportunities for farmers, thus affecting the family dependency index. Japan's vocational training experience is a good testimony.

At present, Chinese farmers have placed too much social security expectations on the land., and a comprehensive and extensive social security system can reduce farmers' dependence on land. Effective insurance policies and adequate financial allocations are important to the rural social security system, which affects farmers' medical conditions, pensions, employment, and education. Take US and Japan as examples, both the US insurance system and the Japanese agricultural pension system have promoted rural land transfer.

Villagers' self-government system is implemented in rural China, and village cadres have the right to master rural governance. The common atmosphere that village cadres "take power for personal gain" has stimulated the desire of peasants to become village cadres. Strict regulations and supervision systems can reduce the possibility of village cadres seeking personal gain, reduce the participation of farmers with speculative psychology, and make the elected village cadres more disinterested and capable. Policy changes cannot determine whether an individual has the experience of a village cadre but can decide those who has the certain qualities could become a village cadre.

The disclosure of circulation information, farmer's vocational training and the social security system can not directly affect the family decision mode, family conflict type and family conflict frequency, but can influence the concept of family members, affect the content of family decisions and decision makers' attitude, which in turn affect these three variables.

From the experience of Japan and the United States, the efficiency of agricultural operations is an important factor affecting the actual managing area. Farmers have a high input-output ratio are more willing to make full use of contracted land or even inflow land.

The government's incentives for agricultural scale-operations and the popularization of agricultural machinery, as well as the financial and technical support for family

farms can improve agricultural efficiency and increase farmers' income, which directly affects the actual farming area.

Policy propaganda and the construction of land transfer intermediaries can provide farmers with more detailed information on circulation. Farmers are more likely to make sound decisions after learning about this information, this could help increase the transfer possibility so that more farmers will have transfer experience. Protecting farmers' interests and allowing farmers to participate in land transfer are important prerequisites. Therefore, strengthening the supervision of the circulation market, learning the circulation law-system of the United States and the de facto participation rights of Vietnamese farmers are also necessary for the transfer of land in China.

In summary, policy and policy instruments can influence these variables through different paths, which in turn affects the willingness to transfer. As shown in the following figure:

Figure 4: The policy-variables affect mechanisms
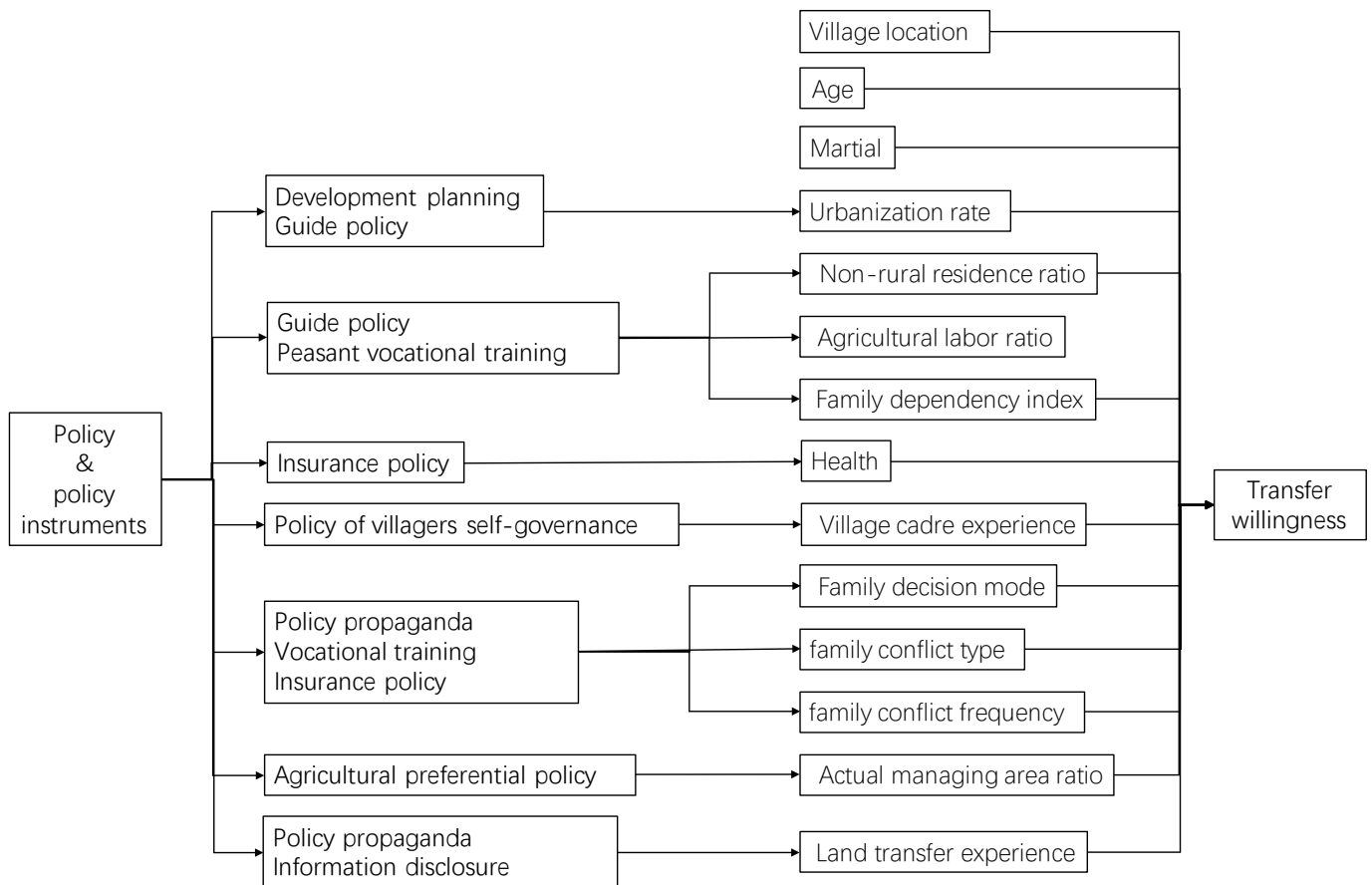
3.4 Validity and reliability

3.4.1 Validity

By clarifying the definition of concepts, misunderstandings in the selection of indicators had been eliminated. In addition, the variables selected for this study were all variables that theories and existing research results had clearly admitted being key factors that could affect farmers' willingness. At the same time, the variables that were

The Influence of household-level Factors on Farmers' Willingness of Agricultural Land Circulation in China: Based on Survey Data From 28 Provinces

subordinate to the four types of household-level factors that could affect farmers' willingness.

Therefore, the choice of indicators was theoretically based and valid.

3.4.2 Reliability

The survey "Thousand People and Villages" conducted by the Renmin University of China was a relatively mature project. Questionnaire design and sampling methods of the project were all completed by professionals, which could guarantee the reliability of the survey data to a large extent. Data collectors with higher education levels maintained data reliability during the data collection phase. Survey data was processed by statistical professionals and reliability was maintained during the data aggregation phase. In summary, the data used in this study is reliable.

3.5 Data Analysis Methods

The research strategy of this research is desk research of secondary quantitative data. As a deductive research, this research is based on the existing theories and researches and tries to find some specific factors that can affect the farmers' willingness to land circulation as well as the mechanisms that these factors work. For deductive research, desk research can help explain national or regional phenomena, test or explain general relations in large geographic scope. For this study, desk research is undoubtedly the most appropriate research strategy.

Among the selected variables, modeling can help us find the key factors through regression. The data analysis method of this study is the Probit model.

When the dependent variable is discrete data, the data needs to be analyzed using the generalized linear model. If the discrete variable has only two values, this variable is called a binary variable. The value of binary variable value is generally 0 or 1, when the value is 0, it means that an event does not occur, and when it is 1, it means that an event occurs (h. Xu and Shi, 2012) .

The basic form of a linear regression model for discrete variables is:

$Y_i = \beta X_i + \varepsilon_i$

Y_i——the interpreted variable

X_i——explanatory variable

β——parameters to be evaluated

ε_i——stochastic disturbance term (Bolin, 2014)

The probability model expression of Y_i is:

$Prob(Y_i=1|X_i)=p$

$Prob(Y_i=0|X_i)=1-p$

In the above linear probability model, $\beta X_i'$ cannot guarantee that the probability is between 0 and 1. In order to ensure that the estimated probability is in the interval of [0-1], a direct idea is to put a standard normal distribution $\Phi(\cdot)$ on the basis of the linear probability model.

The Influence of household-level Factors on Farmers' Willingness of Agricultural Land Circulation in China: Based on Survey Data From 28 Provinces

31

$$\text{Prob}(Y_i=1|X_i)= \Phi(\beta X_i')=\int_{-\infty}^{\beta \text{Xi}'} \frac{1}{\sqrt{2\pi}} \exp(-\frac{z^2}{2})dz,$$

$\Phi(\beta X_i')$ is a normal distribution function with a value range of [0,1], the probabilistic model at this time is called the Probit model (Amemiya, 1978) .

For linear models, the marginal influence of the independent variable on the dependent variables is the coefficients. But for many nonlinear models, the marginal influence is not equal to the coefficient value, especially such as Logit, Probit, Tobit, Mlogit, Ologit and so on.

The marginal effect of the Probit model is (Amemiya, 1978) :

$$\frac{\partial \text{Probit}(Y_i=1|X_i)}{\partial X_i} = \Phi(\beta X_i') \, \beta=\varphi(\beta X_i') \, \beta$$

It is difficult to obtain continuous data on the survey of farmers' willingness of land circulation. The data used in this study to show farmers' willingness to transfer land is also mainly based on disaggregated data. In Probit model, the interpreted variable Y represents the sorting result or classification result(h. Xu and Jin, 2011). In order to deal with a binary-state variable the use of Probit model is more appropriate(Gujarati, 2003).

According to the situation of this study, the equation is:

TW=β_0+β_1RUL+β_2HPS+β_3THH+β_4DMSH+β_5LUCH+μ

In the equation,

$$\text{TW} = \begin{cases} 0, \text{ if transfer willingness= no} \\ \\ 1, \text{ if transfer willingness= yes} \end{cases}$$

Transfer willingness refers to the household's attitude toward land circulation. RUL indicates regional urbanization level, including urbanization rate and village location; HPS indicates household population structure, including non-rural residence, agricultural labor ratio, and family dependency index; THH indicates trait of the head of the household, including age, marital condition, health condition and village cadre experience; DMSH indicates decision mode and stability of the household, including family decision mode, family conflict type, and conflict frequency; LUCH indicates land use characteristics of the household, including actual managing area ratio and land transfer experience.

3.6 Limitations

In some existing studies, family income and income sources, the average educational level of the family, etc., were also studied, but these variables were not included in the study due to limitations in database content and the inability to re-collect data.

The dependent variable of this study is the binary variable, which generalizes the attitude of households to land circulation as simply "willing" and "unwilling", and ignores the divergence between households' attitude.

In order to make it more convenient for statistics, this study introduces many dummy variables, and the method of categorization is adopted in the setting process of

The Influence of household-level Factors on Farmers' Willingness of Agricultural Land Circulation in China: Based on Survey Data From 28 Provinces

32

dummy variables. Although the author has tried to reasonably classify the data, these dummy variables still more or less discount the actual situation.

According to the data screening criteria mentioned before, some samples were deleted from this study. In the subsequent modeling, the samples actually used for research were greatly reduced through outliers and extreme value processing. This may affect the representativeness of the sample across the country.

In the endogeneity test, it was difficult to ensure that the instrumental variable is independent of the dependent variables, and the correlation between the instrumental variable and the endogenous variable is weak. There is a risk that the instrumental variable is a weak instrumental variable, which leads to biased estimation results.

The Influence of household-level Factors on Farmers' Willingness of Agricultural Land Circulation in China: Based on Survey Data From 28 Provinces

33

Chapter4: Research Findings

This chapter includes 2 parts. Firstly, using the dataset to make the descriptive statistics and find the characteristic of the samples; secondly, using the dataset to make the Probit estimate and find the significant indicators that could affect the households' willingness to circulate farmland.

4.1 Descriptive statistics

The following table is the descriptive statistics of 1356 samples, showing the name of the variable, the classification of the variable, the observations and weight of the different categories of the variable, the minimum, maximum, mean and standard deviation of each variable.

Table 5: The descriptive statistic

Concept	Variables	Category	Obs.	Min	Max	Mean	Sd.
Household's willingness to transfer land (Y)	Transfer willingness	unwilling	737	0	1	0.46	0.50
		willing	619				
Regional urbanization level (control variable)	Urbanization rate	—— ——	1356	2.68	87.99	39.90	17.31
	Village location	City-rural integration area	249	1	4	2	1.17
		near cities	204				
		near towns	260				
		far from cities/towns	643				
Household population structure (X1)	Non-rural residence ratio	—— ——	1356	0.00	1.00	0.24	0.28
	Agricultural labor ratio	—— ——	1356	0.00	1.00	0.08	0.13
	Family dependency index	—— ——	1356	0.00	1.00	0.49	0.30
Trait of the head of household (X2)	Age-head	—— ——	1356	23	90	55.75	12.65
	Martial-head	unmarried	31	1	4	2.14	0.56
		married with spouse	1206				
		divorced	17				
		widowed	102				
	Health-head	healthy	1073	1	4	1.30	0.66
		chronic disease	203				
		serious illness	42				
		disabled and mentally disorder	38				
	Village cadre-head	No	1174	0	1	0.13	0.33
		Yes	153				

	Family decision mode	One person has the final say	431	1	3	1.70	0.50
		family consultation	897				
		not sure	28				
Decision mode and stability of the household (X3)	Family conflict type	basically no	63	1	10	4.93	2.93
		couple relationship	84				
		the employment of family members	585				
		economic problems	156				
		children's education	28				
		support the old	15				
		religion	68				
		life trivia	3				
		chlidren's marriage	198				
		other	156				
	Conflict frequency	basically no	922	1	4	1.54	0.90
		1 time	211				
		2-3 times	142				
		more than 3 times	81				
Land use characteristics of the household (X4)	Actual managing area ratio	—— ——	1356	0.00	1.00	0.87	0.29
	Land transfer experience	No	1184	0	1	0.13	0.33
		Yes	172				

Based on the descriptive statistics, we can find that:

Most (54.35%) farmers are reluctant to circulate farmland. According to the survey of ten provinces in 2010 by Chinese scholars Yue Zhang, regardless of the willingness to inflow or outflow, the percentage of farmers who are unwilling to transfer land is low, respectively 61.9% and 80.2%(Yue, 2010b).In contrast, the willingness of Chinese farmers to transfer land has increased greatly in the past eight years.

The "Urbanization rate" measures the urbanization rate of the county in which the village is located, and its standard deviation is relatively large compared to other variables. There are large differences in the urbanization rates between different provinces in China, in different cities of a province, and in towns in cities. The samples from the whole country reflect a greater difference in urbanization rates. In 2017, the urbanization rate of China was 58.52%13, The average urbanization rate of the sample is about 39.9%, which is basically in line with the actual situation in China.

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13 Data cited from China National Bureau of Statistics,
http://www.stats.gov.cn/tjsj/zxfb/201802/t20180228_1585631.html

The Influence of household-level Factors on Farmers' Willingness of Agricultural Land Circulation in China: Based on Survey Data From 28 Provinces

35

Among the samples, we could that about half of the villages are far from the city or towns, while the villages in the "city-rural integration area", "near Cities" and "near towns" are more evenly distributed.

The average value of the "Non-rural residence ratio" is 0.24, indicating that an average of 24% of the population per household is not living in rural areas for most of the time, with a standard deviation of 0.28, indicating that the proportion of the non-rural population of all sample households is not much different.

The average value of the "agricultural labor ratio" is 0.08, indicating that an average population of about 8% of the sample households is still engaged in agricultural work, which is a relatively low proportion. In 2012, the proportion of rural agricultural employees was 27.85%[14], small standard deviation indicates that the low agricultural labor ratio is already a common phenomenon in China.

The average value of the "family dependent index" is 0.49, which means that half of the family members do not work and rely on others. The national family dependency index in 2016 was 37.9%[15], in contrast, the sample families have to bear greater support pressure than the national average.

The average age of the head of the household is 55.75, which is in line with the actual situation in rural China. It also reflects Chinese traditional culture—— although young people have newly established families, many of them still live with their parents. However, the span of the "age of the head of the household" between 23 and 90 still brings a large standard deviation.

Among the sample households, 88.94% of the heads of households are married. In the other three cases, "unmarried" and "divorced" situations are less than "widowed".

The health of the head of the household is generally good, the head with "health" and "chronic diseases" account for 94.1%.

Only 11.28% of the head of the households have been served as village collective cadres.

As to the family decision mode, two-thirds of the farmers choose to decide on family matters in a negotiated manner, and nearly one-third of the households are dictatorial. In addition, 2% of households do not have a fixed decision-making model in the face of family events.

Statistics show that the three most common conflicts among sample households are the "employment of family member", "children's marriage" and "economic problem". These three contradictions are the most common contradiction in nearly 70% of sample households. The average frequency of conflicts is about 1-2 times per year. There are 67.99% of the sample households generally do not have conflicts, which means that the family is relatively stable, and 5.79% of the sample households often have conflicts.

It can be seen from the statistics that some households have completely separated from agricultural production. The actual managing area accounts for 87% of the total contracted area, and another 13% were abandoned or transferred to others. In terms of

14 Data cited from China National Bureau of Statistics, http://data.stats.gov.cn/easyquery.htm?cn=C01

15 Data cited from China National Bureau of Statistics,
http://data.stats.gov.cn/search.htm?s=%E5%AE%B6%E5%BA%AD%E4%BA%BA%E5%8F%A3%E6%8A%9A%E5%85%BB

The Influence of household-level Factors on Farmers' Willingness of Agricultural Land Circulation in China: Based on Survey Data From 28 Provinces

36

circulation experience, 87.32% of the sample farmers never in-flowed or out-flowed farmland, and 12.68% of the farmers had experience of land circulation. At the end of 2016, nearly 70 million rural households with contracted land in China have transferred part or all of their contracted land(h. Zhang, 2017), that is, about 30.4% of the farmers have land circulation experience, and the sample household circulation experience of this study is less than the national average.

4.2 Probit Estimation

4.2.1 Correlation

When selecting variables, we should try to avoid the phenomenon that the correlation coefficients between variables are large. The following table shows the correlation coefficients between the variables selected in this research:

Table 6: The correlation coefficients between variables

	UR	VL	NRR	ALR	FDI	AH	MH	HH	VCH	FDM	FCT	CF	AMAR	LTE
UR	1.0000													
VL	-0.1172	1.0000												
NRR	-0.0514	0.0172	1.0000											
ALR	0.0233	0.0076	0.6050	1.0000										
FDI	0.0396	-0.0114	-0.1595	-0.1244	1.0000									
AH	0.1248	-0.0323	0.0028	0.1722	0.3675	1.0000								
MH	-0.0332	0.0118	0.0489	0.0815	0.0416	0.2078	1.0000							
HH	-0.0351	0.0163	-0.0168	0.0062	0.1202	0.1283	0.0377	1.0000						
VCH	0.0029	-0.5980	0.0148	-0.0001	0.0834	0.1075	0.0442	-0.0079	1.0000					
FDM	0.0843	0.0367	0.0664	0.0501	-0.0299	0.0057	-0.0846	-0.0258	-0.0779	1.0000				
FCT	0.0019	-0.0233	0.0264	0.0646	0.0652	0.0971	0.0304	0.0353	0.0175	-0.0454	1.0000			
CF	0.0036	-0.0510	0.0302	-0.0067	-0.1106	-0.0740	-0.0320	-0.0080	-0.0517	0.0023	-0.2212	1.0000		
AMAR	0.0177	-0.0429	-0.0208	-0.0131	0.0096	0.0301	-0.0362	0.0420	0.0063	-0.0384	0.0227	-0.0079	1.0000	
LTE	0.0397	0.0565	0.0026	-0.0005	-0.0434	-0.0296	0.0247	-0.0176	-0.0607	0.0357	0.0070	-0.0749	-0.1199	1.0000

From the variable autocorrelation coefficient matrix, most of the correlation coefficients are smaller than 0.1, that means the correlation is low. But there are two groups of correlation coefficients greater than 0.5. In order to test whether there is serious collinearity between the variables, this research used VIF for further testing.

After testing, the value of the mean VIF is 1.27<5, it can be considered that there is no serious multi-collinearity between the variables.

4.2.2 T-test

In order to study whether the different categories of these categorical variables have an impact on the "transfer willingness", it is necessary to conduct further research on variables that are significantly different between groups in the statistical estimation.

The Influence of household-level Factors on Farmers' Willingness of Agricultural Land Circulation in China: Based on Survey Data From 28 Provinces

37

It should be stated that the result of the T-test is to describe the data and establish statistical estimation more reasonably, but not the causality of any sort.

There are 5 non-ordered categorical variables with the number of the categories is greater than 2, namely, "Village location", "Martial-head", "Health-head", "Family decision mode" and "Family conflict type".

This study performed a T-test on categorical variables to determine which categorical variables have significant inter-group differences.

Table 7: Inter-group T-test (Village location)

	1	2	3
2	0.340		
3	0.466	0.098	
4	0.046	0.003	0.250

Table 8: Inter-group T-test (Martial-head)

	1	2	3
2	0.699		
3	0.661	0.404	
4	0.382	0.281	0.235

Table 9: Inter-group T-test (Health-head)

	1	2	3
2	0.300		
3	0.295	0.611	
4	0.444	0.244	0.197

Table 10: Inter-group T-test (Family decision mode)

	1	2
2	0.613	
3	0.290	0.847

Table 11: Inter-group T-test (Family conflict type)

	1	2	3	4	5	6	7	8	9
2	0.634								
3	0.430	0.829							
4	0.409	0.746	0.835						
5	0.889	0.828	0.707	0.657					
6	0.404	0.567	0.601	0.665	0.523				
7	0.184	0.348	0.314	0.451	0.374	0.978			
8	0.789	0.688	0.649	0.631	0.760	0.555	0.513		
9	0.817	0.722	0.384	0.399	0.994	0.436	0.154	0.740	
10	0.821	0.734	0.430	0.428	0.993	0.442	0.169	0.741	0.997

The test results show that there is a significant difference between groups in "Village location"; there is no significant difference between groups in "Martial-head", "Health-head", "Family decision mode" and "Family conflict type". Therefore, it is necessary to further study the impact of different groups of "Village location" on "transfer willingness" in the Probit model establishment.

4.2.2 Expected impacts

According to the literature and the author's existing research on rural land transfer in China, the author predicts that the variables selected in this study should have the following positive or negative impacts on "Land transfer willingness":

The Influence of household-level Factors on Farmers' Willingness of Agricultural Land Circulation in China: Based on Survey Data From 28 Provinces

38

Table 12: Expected impacts of the variables on "Land transfer willingness"

Variables	Affect	Explanation
Urbanization rate	+	Higher urbanization rate, more willing to circulate land
Village location	-	Near from the city, more willing to circulate land
Non-rural residence ratio	+	Less family members live rural area, more willing to circulate land.
Agricultural labor ratio	-	Smaller proportion of agricultural labor,more willing to circulate land
Family dependency index	+	Greater support pressure, more willing to circulate land
Age-head	+	Older farmers are more willing to circulate land
Martial-head	?	Not sure
Health-head	+	Unhealthy farmers are more willing to circulate land
Village cadre-head	+	Farmers have experience as village cadres are more willing to circulate land
Family decision mode	?	Not sure
Family conflit type	?	Not sure
Conflict frequency	-	Unstable families are less willing to circulate land
Actual managing area ratio	-	Lower actual managing area ratio, more willing to circulate land
Land transfer experience	+	Household with transfer experience are more willing to circulate land

The Probit model estimation will verify the author's predictions and give the significance and impact coefficients of each variable.

4.2.3 Probit estimation results

In order to improve the accuracy of the results, this study used a stepwise regression approach. 1356 observations were used to analyse the relationship between household-level factors and the willingness of households to transfer farmland (they are originally 1356 observations, but as the number of variables entering the model increase, they drop due to missing values, see N of different models). The Probit estimation results are shown in the annex.

In order to study the marginal effect of the independent variable on the dependent variable, this study performed a marginal effect analysis on the Probit regression results, as shown in the following table.

The Influence of household-level Factors on Farmers' Willingness of Agricultural Land Circulation in China: Based on Survey Data From 28 Provinces

Table 13: Marginal analysis

Concepts	Variables	dy/dx (1)	dy/dx (2)	dy/dx (3)	dy/dx (4)
Regional urbanizatio n level	Urbanization rate	0.001** (1.72)	0.000 (0.36)	0.000 (0.60)	0.000 (0.50)
	Village location -near cities	-0.034 (-0.76)	-0.549*** (-18.35)	-0.544*** (-18.15)	-0.538*** (-18.21)
	Village location - near towns	0.043 (1.02)	-0.480*** (-17.98)	-0.483*** (-18.35)	-0.478*** (-17.89)
	Village location -far from cities/towns	0.079** (2.20)	-0.476*** (-27.01)	-0.475*** (-27.43)	-0.749*** (-27.98)
Household population structure	Non-rural residence ratio	0.186*** (3.17)	0.229*** (4.48)	0.233*** (4.57)	0.235*** (4.60)
	Agricultural labor ratio	-0.121** (-2.12)	-0.156*** (-2.96)	-0.152*** (-2.78)	-0.159*** (-3.03)
	Family dependency index	-0.38*** (-9.16)	-0.318*** (-7.40)	-0.315*** (-7.32)	-0.311*** (-7.32)
Trait of the head of household	Age-head		0.002 (1.50)	0.002 (1.65)	0.002* (1.74)
	Martial-head		0.026 (1.26)	0.025 (1.19)	0.020 (0.97)
	Health-head		-0.000 (-0.05)	-0.001 (-0.07)	0.002* 0.12
	Village cadre-head		-2.216*** (-52.49)	-2.316*** (-52.00)	-2.303*** (-52.94)
Decision mode and stability of the household	Family decision mode			-0.029** (-2.21)	-0.209** (-2.22)
	Family conflict type			-0.003 (-0.69)	-0.003 (-0.62)
	Conflict frequency			0.013 (0.95)	0.016 (1.19)
Land use characteris tics of the household	Actual managing area ratio				-0.145*** (-3.51)
	Land transfer experience				0.077** (2.19)
	N	1356	1327	1327	1327
	Pseudo R2	0.0532	0.1938	0.1974	0.2077
	Prob > chi2	0.000	0.000	0.000	0.000

Standard errors in parentheses

* p<0.1, ** p<0.05, *** p<0.01

The Influence of household-level Factors on Farmers' Willingness of Agricultural Land Circulation in China: Based on Survey Data From 28 Provinces

The unit of the analysis is the household, the dy/dx (1)-(4) are the stepwise regression results of adding the "Household population structure", "Trait of the head of household", "Decision mode and stability of the household" and "Land use characteristics of the household".

The Pseudo R^2 is 20.7%, and the model's significance (Prob > chi2) is 0.000, indicating that the model is significant. In order to further verify the goodness of fit of the model to the data, a "goodness-of-fit test" test was performed in Stata 14.1, and the test result was p = 0.9497 (see annex), indicating that the model fits the data well.

There are 9 variables that have a significant impact on the model, one of which is the control variable "Village location", and the remaining eight are "Non-rural residence ratio", "Agricultural labor ratio", "Family dependency index"," Age-head', "Village cadre-head", "Family decision mode", "Actual managing area ratio" and "Land transfer experience". Other variables have no significant effect on the model.

Consistent with the expectation, the "Urbanization rate" has a positive but not significant impact on the willingness of land circulation, indicating that the higher the level of urbanization, the stronger the willingness to transfer land. From a marginal point of view, ceteris paribus, for every one percent increase in the urbanization rate, the probability that farmers are willing to transfer land increases by 0.01 percentage point.

The estimation results show that regardless of the specific location of the village, the location of the village will significantly affect the farmers' willingness to transfer land. The Village location is significant at the level of 0.01 and the sign of the coefficients is all "-", which is consistent with expectation. It shows that although the location of the village has a significant impact on the transfer willingness, it has different significance among different groups, the farther the village locates away from the city, the willingness will become lower. From a marginal point of view, ceteris paribus, the probability of farmers being willing to transfer land is 53.8 percentage points lower than that of villages locates in the city-rural junction areas. Compared with villages locates in the city-rural junction areas, villages close to the town and far from the town, the probability of farmers being willing to transfer is 47.8 percentage points and 74.9 percentage points lower.

The "Non-rural residence ratio" is significant at the level of 0.01 and has a positive impact on the circulation willingness, which consistent with the expectation, indicating that the more family members do not live in rural areas, the more farmers tend to transfer land. From a marginal point of view, ceteris paribus, for every one percentage point increase in the "Non-rural residence ratio", the probability that farmers are willing to transfer land increases by 23.5 percentage points.

The "Agricultural labor ratio" is significant at the level of 0.01 and has a negative impact on the willingness to land circulation. It is consistent with expectations, indicating that the fewer people in the total labor force are engaged in agricultural work, and the households are more willing to transfer land. From a marginal point of view, ceteris paribus, for every one percentage point increase in the "Agricultural labor ratio", the probability of farmers being willing to transfer land is reduced by 15.9 percentage points.

"Family dependency index" is significant at the level of 0.01 and has a negative impact on the willingness to flow. It is inconsistent with expectations, indicating that the more people need to support the family, the less likely the family is to transfer the

The Influence of household-level Factors on Farmers' Willingness of Agricultural Land Circulation in China: Based on Survey Data From 28 Provinces

41

land. From a marginal point of view, ceteris paribus, for every one percentage point increase in the "Family dependency index", the probability of farmers being willing to transfer land is reduced by 31.1 percentage points.

"Age-head" is significant at the level of 0.1 and has a positive impact on the willingness to circulate, consistent with expectations, indicating that the older the head of the household is, the more willing the household to transfer the land. From a marginal point of view, ceteris paribus, the probability of farmers being willing to transfer land increases by 0.2 percentage points for each one-year-old increase in the age of the head of the household.

"Martial-head" has no significant impact on the willingness to circulate, indicating that the marital status of the head of household has no significant impact in the decision to transfer land.

"Health-head" has no significant impact on the circulation willingness, but it still has a positive impact—— consistent with expectations. It shows that the poorer the health of the head of the household, the more the family is willing to transfer the land. From a marginal point of view, ceteris paribus, once the health condition is reduced by one level, the probability of farmers being willing to transfer land is increased by 0.2 percentage points.

"Village cadre-head" is significant at the level of 0.01 and has a negative impact on the land circulation willingness, which is inconsistent with expectations. Which means that if the head of household has the experience as a village cadre, the family is unwilling to transfer the land.

The "Family decision mode" is significant at the level of 0.05 and has a negative impact on the willingness to circulate, which is inconsistent with expectations. It shows that the transfer willingness democratic decision-making family is lower than the authoritarian family. From a marginal point of view, ceteris paribus, the degree of family decision-making democracy is reduced by one level, and the probability that households are willing to transfer land increases by 20.9 percentage points.

The "family conflict mode" has no significant impact on the circulation willingness to flow, indicating that the type of family conflict does not play an important role in the decision to transfer land.

"Conflict frequency" has no significant impact on the land circulation willingness, but has a positive impact. The households indicating that the family stability is lower are more willing to transfer the land, which is inconsistent with the expected results.

"Actual managing area ratio" is significant at the level of 0.01 and has a negative impact on the land circulation willingness, which is consistent with expectations. It shows that the higher the proportion of land cultivated by households in household contracted land, the more reluctant farmers are to transfer land. From a marginal point of view, ceteris paribus, the actual proportion of cultivated area increased by 1 percentage point, and the possibility of households will be able to transfer land by14.5 percentage points.

The "Land transfer experience" is significant at the 0.05 level and had a positive impact on the willingness to flow, which is consistent with expectations. It shows that farmers with transfer experience are more willing to transfer land. From a marginal

point of view, ceteris paribus, if farmers have land transfer experience, the possibility that households will be willing to transfer land will increase by 7.7 percentage points.

4.2.4 Exogeneity test

The causes of endogeneity are mainly variable-missing (and missing variables are related to other variables introduced into the model) and explanatory variables and interpreted variables are mutually causal (F. He, 2007) , and endogeneity leads to biased parameter estimation. In order to eliminate the endogeneity of the explanatory variables in the equation, the instrumental variable is introduced in this research. The idea of instrumental variables is to replace the endogenous variables with appropriate tools and reduce the correlation between explanatory variables and random term. The instrumental variable must satisfy two conditions:

Condition 1, it is related to the endogenous variable in the structural equation to be replaced, $cov(Z,X) \neq 0$;

Condition 2, the instrumental variable must be an exogenous variable, independent of the random term, $cov (Z,X) = 0$ (Sun, 2008) .

The two-stage least squares estimation (2SLS) proposed by Theil (1953) and Basmann (1957) can solve the problem of estimation error caused by least squares estimation when using instrumental variables.

2SLS consists of two phases. In the first stage, ordinary least squares (OLS) is applied to the simplified equation of the model to obtain an estimate of the endogenous variable. In the second stage, replace the endogenous variable with the estimate obtained in the first stage, and then apply the OLS to the equation to obtain an estimate of the parameter (F. He, 2007) .

In this study, the "Agricultural labor ratio" is more likely to be an endogenous variable. Because the transfer willingness may be affected by the proportion of the agricultural workforce in the family workforce. In other words, it is precise because there is more labor in the family to engage in agriculture, the families become reluctant to transfer land.

The education level of the head of the household was chosen as a tool variable for the "Agricultural labor ratio".

The head of the household is the leader of the family and an important decision-maker in rural China. If the head of the household has a high level of education, he/she is more likely to have the experience of living and working in the city, and is more likely to master more advanced production methods and improve work efficiency; he/she is more likely to have a more avant-garde impact on family members' career choices. Therefore, the education level of the head of the household is related to the "Agricultural labor ratio", so the instrumental variable meets Condition 1.

The education level of the head of the household is an exogenous variable, which has one-way causality with transfer willingness. That means, the education level can affect the transfer attitude, but the transfer attitude cannot determine the level of education. This makes the education level of the head of the household satisfy the condition 2.

Tested by Two-Stage Least Squares (2SLS), the Wald test of exogeneity is 0.55, p>chi2=0.4593 (see annexe). This shows that the "Agricultural labor ratio" is not

statistically an endogenous variable. Therefore, the author believes that the regression results are still as shown in Table 13.

4.2.5 Robustness test

In order to test the robustness of the result of Probit estimation, this study uses a comparison between the regression results of OLS and the results of the Probit model.

Comparing the results of different regression methods is an effective way to test robustness (Xing, 2015) . If there are different significant variables in two models, that means this variable does not pass the robustness test and needs further processing like introducing the interaction term of the variable or replace the variable with another variable.

This study chose to use OLS estimated results as a comparison. Using OLS, the unknown parameter can be easily obtained and the sum of the squares of the errors between the obtained data and the actual data is minimized. OLS is also one of the most widely used linear estimation methods.

The following table shows the regression results of the Probit model and the OLS model (see annex).

Table 14: Robustness test

| | variable | UR | VL | | | NRR | ALR | FDI | AH |
			near cities	near towns	far from cities/towns				
Probit	cofe. z	0.001 (0.50)	-6.079*** (-44.82)	-5.892*** (-49.14)	-5.897*** (-51.70)	0.757*** (4.48)	-0.513*** (-2.99)	-1.002*** (-6.82)	0.006* (1.74)
	variable	MH	HH	VCH	FDM	FCT	CF	AMAR	LTE
	cofe. z	0.066 (0.97)	0.007 -0.12	-7.420*** (-37.10)	-0.093** (-2.21)	-0.008 (-0.62)	0.053 (1.19)	-0.466*** (-3.45)	0.250** (2.18)
	Pseudo R^2=0.207								
	variable	UR	VL			NRR	ALR	FDI	AH
			near cities	near towns	far from cities/towns				
OLS	cofe. t	0.000 (0.62)	-0.571*** (-15.01)	-0.496*** (-14.92)	-0.498*** (-19.53)	0.241*** (4.55)	-0.157*** (-3.07)	-0.321*** (-7.05)	0.002* (1.82)
	variable	MH	HH	VCH	FDM	FCT	CF	AMAR	LTE
	cofe. t	0.024 (1.15)	0.004 (0.22)	-0.891*** (-32.97)	-0.029** (-2.20)	-0.002 (-0.45)	0.016 (1.15)	-0.148*** (-3.43)	0.076** (2.00)
	Adjust. R^2=0.217								

* p<0.1, ** p<0.05, *** p<0.01

By comparing the regression results of Probit and OLS, it can be found that the variables that were significant in the Probit model are also significant in the OLS model. Except for "Family decision mode" and "Actual managing area ratio", the significance levels of the significant variables are consistent in the two models, and the symbols of the coefficients of all variables do not change. It can be determined that the regression result of the Probit model is robust.

The Influence of household-level Factors on Farmers' Willingness of Agricultural Land Circulation in China: Based on Survey Data From 28 Provinces

In the Probit model, "Family decision mode" is significant at the level of 0.05, and "Actual managing area ratio" is significant at the level of significance of 0.1. In the OLS model, the significance level of "Family decision mode" decreases to 0.1, and the significance level of "Actual managing area ratio" increases to 0.01. This indicates that the two variables are of different significance in different models, but it does not prevent the robustness of the results of Probit estimation.

4.3 Interpretation of significant variables

The above parts provide a simple explanation and robust analysis of the statistical results of the Probit model. This section attempts to explain the mechanism of the influence of significant variables according to the actual situation in China.

The closer the geographical location is to the city, the more willing the household to transfer the land. Firstly, farmers living close to cities and towns have more access to the job opportunities provided by the city. These jobs may be more decent and with higher wages, farmers might be attracted to the cities, and the labor force left in the countryside will be reduced. Because of economic rationality, farmers will be more willing to transfer agricultural land, on the one hand, to obtain circulation income, on the other hand, not to abandon the farmland. Secondly, farmers living close to cities and towns have more access to the transfer information and have more knowledge about related policies, which may also encourage farmers to transfer land.

The more family members who do not live in the rural area / the fewer people work in agriculture, the more willing the household to transfer the land. In the last 30 years, China's urbanization has developed rapidly, more and more farmers have left the countryside and live the urban life, this situation has reduced the rural labor force. The income of rural households becomes more dependent on non-agricultural income. Farmers' lives are less dependent on land and they are more inclined to transfer land.

The more people the family needs to support, the less likely the family is to transfer the land. This research result is different from expectation and many existing research conclusions. In theory, the higher the family support index is, the greater the pressure on the other people in the family, the more inclined to leave the countryside to go to the city to find higher-paying jobs, and thus willing to transfer the land. However, the conclusion of this study is exactly the opposite. According to the actual situation in China, the possible explanation is: due to the security function of farmland, if it is difficult for family with high dependency index to ensure family members' living standard in the case that China's rural social security system is still not perfect, the household does not dare to transfer land easily.

The older the head of the household, the more willing the household to transfer the land. The head of the Chinese families is usually adult male in the family. They are important decision makers of the family and important labor force.

The level of agricultural modernization in China is limited. Agricultural production mainly depends on farmers' heavy physical work. The head of the household is the most important labor force in the family. As the age increases, the ability to engage in manual labor will also decline. Therefore, the older the head of the household, the more the family is willing to transfer the land and receive the transfer income.

Farmers with experience as village cadres are more reluctant to transfer land, the results of this study are contrary to expectations. Combined with the actual situation

The Influence of household-level Factors on Farmers' Willingness of Agricultural Land Circulation in China: Based on Survey Data From 28 Provinces

in China, the possible explanation is that village cadres have a better understanding of the policies, operations and bad results of land transfer. At present, land circulation in rural China mainly consists of spontaneous circulation and collective unified circulation. Spontaneous circulation has a wide range of situations such as non-standard contract and random price, village committees and local governments obtain illegitimate interests. Compared with the other villagers, the village cadres know more about related information, so their willingness to transfer may be reduced.

Families with democratic decision-making have lower willingness to circulate land, this result is contrary to expectations. Combined with the actual situation in China, the cost of the decision-making mechanism itself may be an important reason for this situation. Democratic decision-making should take the opinions of all family members into account. If most people disagree with the decision, the family can't transfer the land, and the dictatorial family only needs the dictator to make the transfer decision.

The higher the proportion of land cultivated by households in, the more reluctant household is to transfer land. There are two cases for households with a large proportion of cultivated area in the total contracted area. One case is that the efficiency of household agricultural production is high, and the agricultural income of such farmers is also generally higher, so even if there are few people engaged in agricultural production in the family, the households are not willing to transfer the agricultural land. In another case, the household's living standard depends on agriculture, in this case, the household's willingness to transfer is also lower.

Farmers with circulation experience are more willing to transfer land. At present, there exists a wide range of information inequality about China's land transfer. Farmers with experience of land circulation have a better understanding of the policies, procedures, prices, contracts, etc. of the circulation. Under the same conditions, they are more daring to transfer land than those who do not have experience in circulation.

The Influence of household-level Factors on Farmers' Willingness of Agricultural Land Circulation in China: Based on Survey Data From 28 Provinces

46

Chapter5: Conclusion and recommendation

This chapter summarizes the main contents of the research, including research purposes, research content, summative answers to main question and sub-question and recommendations.

5.1 Why land circulation in China?

In the past decade, urbanization has become the biggest driving force for China's economic growth and social development, and the trend of rural land circulation related to this has become increasingly obvious.

China's agricultural land transfer and urbanization have complex links. China's urbanization development requires the transfer of agricultural land, but the current phenomenon of harming farmers' interests in land transfer strengthens the social security function of land and reduces the willingness of farmers to transfer land. The low willingness constrains the speed and efficiency of land transfer, which in turn will hinder the urbanization process.

5.2 Why transfer willingness and household-level factors?

Farmers are important players in rural land transfer. Farmers' wishes and behaviour have a fundamental impact on rural land transfer, and its mechanisms, models and efficiency. Studying the influencing factors of farmers' willingness can help us correctly understand the problem of land transfer in China, help to alleviate the problem of rural land abandonment and decentralization, and improve the efficiency of rural land use.

The family-based agricultural economy has existed in China for more than two thousand years, which impact on Chinese society is enormous and far-reaching. China's current rural land system determines that households are still farmland managers and decision-making units. As farmers' production and living units, households are the basic organizations for farmers to participate in social activities, and their structure, stability have a great impact on households' transfer willingness.

5.3 Research methods and data source

The dataset used in this study is the survey data of the "Thousand Investigators & hundred Villages" social survey held by the School of Public Administration of Renmin University of China in 2017. The samples are from 279 villages in 28 provinces in China. The sample size is 1327.

The research strategy of this study is desk research of secondary quantitative data. The Data analysis method is the Probit model.

5.4 Conclusive answers to research questions

What household-level factors affect the farmers' willingness to circulate rural land?

There are 9 variables that have a significant impact on the model: non-rural residence ratio, agricultural labor ratio, family dependency index, age of the head of the

The Influence of household-level Factors on Farmers' Willingness of Agricultural Land Circulation in China: Based on Survey Data From 28 Provinces

47

household, experience as village cadre, family decision mode, the actual managing area ratio and land transfer experience are the eight important household-level factors could affect transfer willingness. Except for these household-level factors, the village location also has the significant impact on transfer willingness.

Urbanization rate， martial situation of the head of the household， health condition of the head of the household，family conflict type, conflict frequency have no significant effect on the transfer willingness.

How do these factors affect the farmers' willingness to circulate rural land?

The influence of these household-level factors on the willingness to flow has different significance and positive (negative) attributes, and it also affects the transfer willingness through different mechanisms.

By studying these mechanisms, we can find that these 8 household-level factors have an impact on land transfer willingness mainly through five aspects.

First, the family dependency index affects the transfer willingness through the family's passive dependence on the farmland. The more people the family needs to support, the less likely the family is to transfer the land. In Rural China, the social security system is still not complete. The more people need to be supported, the less the family's economic status can be guaranteed, so the farmers do not dare to easily transfer the land.

Second, whether farmers have experience as village cadres and land transfer experience affects transfer willingness through the perception of transfer risk. Farmers with experience as village cadres are more reluctant to transfer land， this may be related to information asymmetry. Many land transfers are currently not regulated in China, due to the farmers' weak position, their transfer interests are often damaged. Village cadres have more access to the bad results, so they are not willing to transfer their own land. Farmers with circulation experience are more willing to transfer land, which also related to information asymmetry. Farmers with experience of land circulation have a better understanding of the policies, procedures, prices, contracts, etc. of the circulation.

Third, non-rural residence ratio and age of the head of the household affects the willingness to transfer through the preference of farmers for land income. The more family members who do not live in rural area， the older the head of the household. Farmers choose to live in cities indicating that they prefer the work provided by the city and are more willing to obtain transfer income rather than agricultural income. When labor capacity of the head of the household declines, the family is more inclined to transfer the land to obtain the transfer income instead of the income from agricultural production.

Forth, the agricultural labor ratio and the actual managing area ratio affect transfer willingness through the farmer's active dependence on the land. The higher the proportion of land cultivated by households in, the more reluctant household is to transfer land. If more family members get jobs in the cities, they will be more willing to transfer land. If the level of mechanization of family farming is high, families will not be willing to transfer land. The fewer people work in agriculture, the more willing the household to transfer the land, this is due to the labor flow to the cities in the urbanization process. Compared with households with great supporting pressures,

The Influence of household-level Factors on Farmers' Willingness of Agricultural Land Circulation in China: Based on Survey Data From 28 Provinces

48

farmers have more choices in these situations, and their dependence on land is relatively proactive.

Finally, families with democratic decision-making have lower willingness to circulate land, this is related to the cost of decision-making and farmers' lack of understanding of land transfer by farmers. Democratic decision-making should take the opinions of all family members into account, it is always difficult to get the majority's consent.

Except these household-level factors, the location of the village also affects transfer willingness. The closer the geographical location is to the city, the more willing the household to transfer the land.

In the rural land circulation in China, what household-level factors will affect the farmers' willingness to transfer land in which way these factors work?

8 household-level factors have a significant impact on farmers' willingness to land transfer through five mechanisms.

Village cadre experience / land transfer experience has a negative and positive impact on land transfer willingness through the perception of circulation risk.

Non-rural residence ratio and age of the head of the household positively affects transfer willingness through the family preference for land income.

Agricultural labor ratio and actual managing area ratio have a negative impact on transfer willingness through active dependence on farmland.

Family decision mode influences the transfer willingness through the procedural cost of the decision. The willingness to transfer households in democratic decision-making is low, and the willingness of dictatorships to transfer land is high.

Figure 5: The influence mechanism of household-level factors on transfer willingness
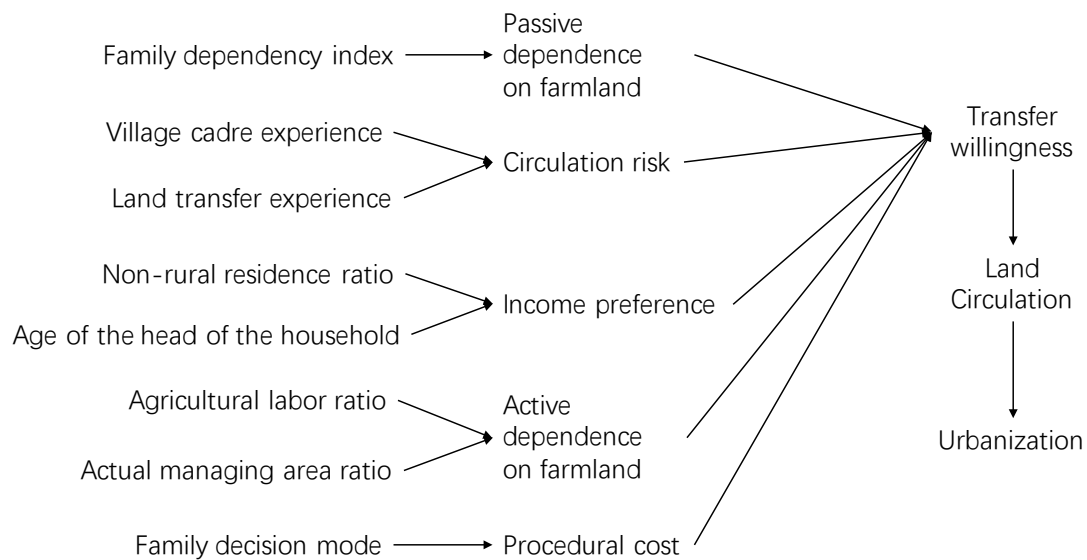
5.5 Recommendation

The land transfer is of great significance for the development of urbanization, and increasing the willingness of farmers to transfer land is an important means to promote land transfer. Based on the findings of this paper, the following policy recommendations are proposed:

The Influence of household-level Factors on Farmers' Willingness of Agricultural Land Circulation in China: Based on Survey Data From 28 Provinces

49

Firstly, strengthen the construction of rural social security systems and reduce farmers' passive dependence on land. At present, China's rural social security level is low and coverage is narrow. Therefore, the various social security functions such as employment, pension, housing, education, and medical care carried by land are very important. Establishing and strengthening a sound rural social security system is not only an important goal of China's urbanization development but also an important basis for promoting land transfer. In this respect, the developed insurance system and insurance market in the United States show the direction to China. China could also learn from the relevant policies and actions of land transfer in Japan, such as the "Agricultural Management Foundation Strengthening Promotion Law", and "Basic Law on Food, Agriculture and Rural Areas"——the agricultural pension system involved in these laws.

Secondly, encourage the "active dependence" farmers to transfer land through vocational training. Farmers who actively rely on farmland have greater flexibility. Encouraging enterprises to absorb rural labor, and strengthening vocational training for farmers, which can give farmers more employment choices. Japanese vocational training system for farmers is worth learning in China. Japanese peasant vocational education conforms to the development of the modern economy, it has formed a multi-level education system such as agricultural vocational high school education, agricultural continuous education, agricultural technology education, and domestic& foreign joint training. It is an important reference for China to accelerate the construction of rural modernization and establish a vocational education system for farmers.

Thirdly, strengthen agricultural modernization, and encourage efficient "active dependent" households to form scale operations. The inefficient small-scale farming is still common in China, which not only couldn't bring ideal benefits to farmers but also forces the labor to stay in inefficient production activities. Agricultural modernization and mechanization could improve the efficiency of agricultural production and can encourage land concentration. The establishment of developed modern agriculture in the United States has always been a farm-based system consisted of family farms, partnership farms, and agribusiness. The widespread use of modern production methods and agricultural machinery has led to a significant drop in costs in agricultural products. Japan's "professional business operator" policy has imposed strict access requirements on agricultural land operators, and also provides financial, technical and policy support for these agricultural professional operators.

Fourthly, increase information disclosure, promote land transfer policies, regulate the behavior of village collectives and local governments, and reduce farmers' concerns about land transfer risks.The willingness of farmers to transfer farmland is low because the transfer policies and procedures are not understood, and the transfer benefits cannot be guaranteed. This is also the result of the irregular circulation of rural land for some time and the improper participation of village collectives and local governments. Strengthening policy propaganda, on the one hand allows farmers to understand the rights and responsibilities of farmers, village collectives, and local governments, and allows farmers to make decisions that are more conducive to land transfer while retaining family democratic decisions. Establishing a transit intermediary similar to the United States and Japan can solve the problem to a large extent. The intermediary is the meeting point of various information, where farmers can get information on policies, procedures, fees, taxes, rights, etc. With this information, farmers are more likely to make sound decisions. In addition, it is

The Influence of household-level Factors on Farmers' Willingness of Agricultural Land Circulation in China: Based on Survey Data From 28 Provinces

50

worthwhile for China to learn from the participation of farmers as stakeholders in the Vietnamese circulation market. Although China's land transfer also emphasizes the rights and interests of farmers, farmers as a vulnerable group cannot truly participate in the real negotiation.

Finally, regulate the land transfer process, strengthen the supervision of the land transfer market, form a reasonable farmland transfer price in the circulation market, and increase farmers' income preferences for the land transfer. At present, the price of agricultural land transfer is generally low and the circulation is not standardized. These situations are not conducive to protecting farmers from obtaining reasonable transfer income. So that farmers have a lower preference for income from circulation. Low transfer willingness and land abandonment caused by farmers' interests damage not only appears in China but also in Russia. It should be recognized that the or circulate results in Russia during a period of time were not only caused by the unguaranteed transfer income but also caused by mismatched policies. In comparison, the comprehensive circulation system and legal system that the United States has established is worth learning from.

5.6 Limitations and further research direction

This study only focuses on the influence of household-level factors on households' willingness to transfer land, some important variables are not taken into consideration, which limits the scope of the research. The dependent variable is subjective feelings, it is difficult to accurately quantify it. Besides, dummy may more or less discount the actual situation. Samples are not completely randomized, and sample representation is subject to errors due to accidental factors. According to the data screening criteria mentioned before, some samples were deleted, which may affect the representativeness of the sample across the country. In the endogeneity test, there exists a risk that the instrumental variable is weak, which may lead to biased estimation results.

This paper attempts to find out the household-level factors that have an important influence on the land transfer willingness and study the impact mechanism. Based on this research, it is possible to further explore whether there are differences in household-level factors that have an important influence on the willingness to transfer in different regions, this is the research that the author wants to carry out.

Annexe

1. Goodness-of-fit test

```
. estat gof

Probit model for Landtransferwillingness, goodness-of-fit test

        number of observations =       1327
  number of covariate patterns =       1326
          Pearson chi2(1309) =        1226.14
                Prob > chi2 =          0.9497

.
end of do-file
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2. The results of Probit estimation

Table 15: The result of Probit estimation

Concepts	Variables	Coef. (1)	Coef. (2)	Coef. (3)	Coef. (4)
Regional urbanizatio n level	Urbanization rate	0.004* (1.71)	0.001 (0.36)	0.001 (0.60)	0.001 (0.50)
	Village location - near cities	-0.093 (-0.76)	-5.715*** (-43.57)	-6.039*** (-43.28)	-6.079*** (-44.82)
	Village location - near towns	0.115 (1.02)	-5.504*** (-48.42)	-6.039*** (-43.28)	-5.892*** (-49.14)
	Village location - far from cities/towns	0.210** (2.18)	-5.493*** (-51.01)	-5.853*** (-49.71)	-5.897*** (-51.70)
Household population structure	Non-rural residence ratio	0.500*** (3.13)	0.723*** (4.37)	0.742*** (4.45)	0.757*** (4.48)
	Agricultural labor ratio	-0.325** (-2.11)	-0.493*** (-2.92)	-0.483*** (-2.84)	-0.513*** (-2.99)
	Family dependency index	-1.019*** (-8.43)	-1.005*** (-6.96)	-1.001*** (-6.90)	-1.002*** (-6.82)
Trait of the head of household	Age-head		0.005 (1.50)	0.006 (1.64)	0.006* (1.74)
	Martial-head		0.084 (1.25)	0.080 (1.19)	0.066 (0.97)
	Health-head		-0.003 (-0.05)	-0.004 (-0.07)	0.007 -0.12

The Influence of household-level Factors on Farmers' Willingness of Agricultural Land Circulation in China: Based on Survey Data From 28 Provinces

Category	Variable	(1)	(2)	(3)	(4)
	Village cadre-head		-7.009*** (-36.76)	-7.366*** (-36.85)	-7.420*** (-37.10)
Decision mode and stability of the household	Family decision mode			-0.092** (-2.19)	-0.093** (-2.21)
	Family conflict type			-0.009 (-0.69)	-0.008 (-0.62)
	Conflict frequency			0.042 (0.95)	0.053 (1.19)
Land use characteristics of the household	Actual managing area ratio				-0.466*** (-3.45)
	Land transfer experience				0.250** (2.18)
	N	1356	1327	1327	1327
	Pseudo R2	0.0532	0.1938	0.1974	0.2077
	Prob > chi2	0.000	0.000	0.000	0

Standard errors in parentheses

* p<0.1, ** p<0.05, *** p<0.01

3. The results of OLS estimation

```
. reg Landtransferwillingness Urbanizationrate i.Villagelocation Nonruralresidenceratio Agriculturallaborra
> tio Familydependencyindex Agehead Martialhead Healthhead Villagecadrehead Familydecisionmode Familyconfli
> cttype Conflictfrequency Actualmanagingarearatio Landtransferexperience, robust

Linear regression                               Number of obs     =      1,327
                                                F(16, 1310)       =     136.04
                                                Prob > F          =     0.0000
                                                R-squared         =     0.2270
                                                Root MSE          =     .43972

-------------------------------------------------------------------------------------
                        |               Robust
 Landtransferwillingness|     Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
------------------------+------------------------------------------------------------
       Urbanizationrate |  .0004456   .0007205     0.62   0.536    -.0009679    .0018591
                        |
           Villagelocation |
                      2 | -.5705075   .0379974   -15.01   0.000    -.6450499    -.495965
                      3 | -.4964179    .033277   -14.92   0.000    -.5616999    -.431136
                      4 | -.4977344    .025485   -19.53   0.000    -.5477303   -.4477385
                        |
  Nonruralresidenceratio |  .2407304   .0529447     4.55   0.000     .1368648    .3445961
   Agriculturallaborratio | -.1571096   .0512172    -3.07   0.002    -.2575863    -.056633
    Familydependencyindex | -.3209033   .0454982    -7.05   0.000    -.4101605   -.2316461
                Agehead |  .0020404   .0011237     1.82   0.070     -.000164    .0042449
             Martialhead |  .0238456   .0207586     1.15   0.251    -.0168782    .0645694
              Healthhead |  .0041547   .0191449     0.22   0.828    -.0334034    .0417127
         Villagecadrehead | -.8910363   .0270289   -32.97   0.000     -.944061   -.8380115
          Familydecisionmode | -.0290999   .0132221    -2.20   0.028    -.0550386   -.0031612
          Familyconflicttype | -.0019166   .0042204    -0.45   0.650    -.0101961    .0063629
           Conflictfrequency |  .0158852    .013842     1.15   0.251    -.0112697    .0430402
    Actualmanagingarearatio | -.1478945   .0431032    -3.43   0.001    -.2324534   -.0633355
       Landtransferexperience |  .0763622    .038177     2.00   0.046     .0014673     .151257
                   _cons |  1.088201   .0945605    11.51   0.000     .9026949    1.273708
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60

The Influence of household-level Factors on Farmers' Willingness of Agricultural Land Circulation in China: Based on Survey Data From 28 Provinces

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61

The Influence of household-level Factors on Farmers' Willingness of Agricultural Land Circulation in China:
Based on Survey Data From 28 Provinces

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The Influence of household-level Factors on Farmers' Willingness of Agricultural Land Circulation in China: Based on Survey Data From 28 Provinces

62