

The Impact of Rural Homestead Reform on the Willingness of Migrant Populations to Settle Down

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ABSTRACT

This paper analyzes and explores the impact of rural homestead reform on migrant workers' urban residence willingness under the reform in the homestead system since 2015 based on the monitoring data of China's migrant population in 2017 and the logistic regression model. According to the classical logistic regression model, researchers control characteristics on the individual, household, and city levels and use the experience of parent's outflow as an instrument, combined with the propensity score matching method and IV method, to solve endogeneity. The preliminary research results show that homestead ownership significantly reduces migrant workers' willingness to stay. In addition, homestead ownership has a weakening effect on the willingness to stay permanently for households in different income brackets, and the weakening effect is strongest for low-income households. If the government attempts to reduce the brain drain and let more talents return to rural areas to build grassroots communities, it can accelerate the promotion of the homestead reform in the whole country accordingly.

Keywords: Homestead Reform, Migrant Workers.

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1. INTRODUCTION

Rapid urbanization in China has triggered the mass migration of rural populations to cities, resulting in the widespread phenomenon of separation between household registration and actual residence (Lu & Lin, 2021). According to the seventh national population census, China has a 375.82 million floating population, and the separated population was 497.76 million. Compared with 2010, there is an increase of 88.52% in separated populations. Among them, the separated population in the municipal area and floating population accounted for 24% and 76%, respectively, and each has an increase of 192.66% and 69.73% over 2010. Besides, the urbanization rate of the resident population is 63.89%, but that of the registered population is only 45.4%. This gap increased in the past three years, indicating a non-permanent migration problem of migrant workers, which results from difficulties in integrating into urban society. Non-permanent migration has been a critical topic in urban-rural migration. Many studies have shown negative effects of non-permanent migration on economic development, such as slowing down the upgrading of industrial structure (Zhao &

Chen, 2013), reducing land resource utilization (Jiao, 2015), and bringing the social problem of left-behind children and elderly (Chen & Zhang, 2018). In order to promote permanent migration, researchers should firstly focus on the residence willingness of migrant workers, which refers to the willingness to move into the city for permanent residence. Compared with the study of long-term residential behavior, it is more realistic and effective to discuss residences' willingness to promote urbanization. Whether for financial concerns or for conventional ideas on the importance of having a house, the land is always an important factor affecting migrants' willingness to stay. China's rural collective land ownership system grants the agricultural population the right to use contracted land and homesteads (Long et al., 2016). Contracted land is allocated to each household for agricultural purposes, while rural homesteads are the portions allotted to rural households from the lands collectively owned by village governments for the purpose of building homes (Liao, 2007). In addition, homestead ownership of rural residents is correlated with their rural-urban migration decision (Zhao, 1999).

1.1 Objectives of the research

The objective of this paper is to examine whether the landholdings of migrant workers affect their residence willingness. The data source is the 2017 China Migrants Dynamic Survey (CMDS) and Urban Statistical Yearbook of China. Logistic regression models are built to measure the effect of rural homestead land ownership and personal and socioeconomic variables on rural migrants' residence willingness.

1.2 Aims of the research

First, we aim to help fill the gap in the literature on the relationship between homestead ownership and residence willingness. Using the 2017 China Migrants Dynamic Survey (CMDS) data, we are able to investigate the degree of homestead factor in rural-urban migrants' residence intentions. Second, we add the homestead reform policy into control in the residence willingness model developed by previous studies. Since the reform was enforced in 2015, it may have influenced migrant workers' residence willingness by their decision of whether to return homestead to the government by 2017. Third, we provide evidence for weighing the pros and cons of the homestead policy reform. On this topic, the current research focuses on exploring the future direction of the reform policy instead of examining the effect of reform or the effect of reform on migrants' residence willingness.

2. LITERATURE REVIEW

2.1 Theoretical Background

Due to the massive migration of rural populations, there arises a problem of inefficient use of homestead land in the rural area. Before the reform, the homestead is unevenly distributed among villagers. Some people own a lot of lands, while others do not have enough land to live. Meanwhile, urban citizens are not allowed to buy these lands, so once rural residents migrate to the city, their homestead becomes vacant (Long et al., 2007). As a result, the homestead vacancy rate was high, up to 60% in some regions (Green Book of Rural Area). To increase the utilization of homesteads, since 2015, 15 counties have started to conduct a pilot program of homestead system reform. The policy requires that each rural household could only have one homestead and encourages households to return homesteads to the government. Money or houses are offered compensation for households' loss of returning extra homesteads. The reform extended to 33 counties in 2018 and 104 in 2020.

However, for migrant workers, the extent to which their homestead land ownership influences their decision to reside in the city permanently remains unclear. Moreover, few studies have discussed the impact of homestead reform since 2015 on migrants' residence choices. As cities have been continuously absorbing rural laborers and seizing rural land, understanding the trade-offs for rural migrants in deciding between rural landholdings and urban residency is crucial for both processes to proceed.

2.2 Factors Affecting Migrants' Residence Willingness

2.2.0 Introduction

Since 2009, numerous researchers have used relevant micro-level data for floating population in China to assess the migration and residence willingness of rural-urban migrants (Zhu & Lin, 2019). Generally, scholars agree that urban integration encompasses economic, social, cultural, and psychological dimensions.

2.2.1 Economic aspect

The migrant population's willingness to stay is closely related to demographic factors such as age, marriage, education level, and gender of the migrant population (Zhu & Chen, 2010). From this perspective, it is understandable that migrants who are relatively young, unmarried, and educated tend to live permanently in cities. Female migrants' high willingness to stay may be related to their more stable employment in the service industry than men's employment in manufacturing and female's disadvantaged position in rural land allocation after returning to their hometowns (Tang & Hao, 2018).

2.2.2 Social aspect

Income level, employment and occupational characteristics, social security, and labor market characteristics of inflow cities are also important factors affecting willingness to stay (Zhu & Chen, 2010; Wang & Ding, 2007; Cao et al., 2015). Generally speaking, the higher the income of migrant individuals, the more stable their employment and better social security status are related to a stronger willingness to settle. Since self-employed persons are less affected by labor market fluctuations and are more stable, they tend to show a higher willingness to settle in cities and towns (Cao et al., 2015). What's more, there are also findings showing that duration and scope of migration (Zhu & Chen, 2010; Xiong & Shi, 2007), social connection (Huang et al., 2018), social integration, and satisfaction of destination cities (Zhang et al., 2014), have significant effects on migrants' willingness to stay.

2.2.3 Culture aspect

The migration status of family members of the floating population and the housing conditions of the floating population in inflow cities have a huge impact on the willingness to stay (Zhu & Chen, 2010). In recent years, relevant studies show that migrants who own houses in destination cities, especially property rights houses, have a strong willingness to stay in cities (Xie & Chen, 2018). Migrants with fewer children and elderly care in their hometowns also tend to reside in cities (Wang and Ding, 2007).

2.2.4 Psychological aspect

The regional characteristics of the inflow area are also important factors. Cities with high-administrative levels and larger populations are more attractive to migrants (Fan, 2021). Better basic public services, such as higher quality of education resources, more sufficient

medical resources, or a better environment, also play important roles in improving migrants' willingness to stay (Lin et al., 2019). Conversely, high relative housing prices inhibit population migration, and this inhibiting effect is better reflected in rural labor (Gao et al., 2012).

2.3 Rural landholding or migration: A dilemma

Many studies have investigated that owning rural land tends to discourage out-migration and encourage return-migration, and the amount of land is positively correlated with the probability of return-migration choice (Wang & Fan, 2006). Improved land tenure security in the absence of complete property rights is negatively correlated with the probability of migration (Mullan et al., 2010). When discussing migrants' decision on homestead landholding under the reform policy, we should pay attention to the role hukou play in this story. The homestead system requires that only residents with rural hukou could own a homestead. Therefore, migrants need to balance their utility from rural-to-urban hukou transfer with the loss of the right to use the contracted rural land and homesteads (Chen et al., 2017; Yu et al., 2016). Some scholars studied the influencing factors of farmers' homestead withdrawal willingness from a microscopic perspective, including personal and family characteristics such as age, education level, number of children in the family, job opportunities, income level, household registration, and institutional factors such as social security (Chen, 2012). Traditional ideas believe that there is a strong connection between urban hukou and residence willingness (Chan & Zhang, 1999). Notwithstanding, subsequent studies showed that this understanding exaggerates the impact of the household registration system on the willingness to stay. In some cases, the influence of household registration system factors on the willingness to stay in the floating population is not even significant (Zhu & Lin, 2014).

2.4 Rationale

Extant studies are relatively scarce when it comes to the link between homestead land and residence willingness. Most studies focus on the impact of the land system, and little attention has been paid to the impact of property rights and interests in land especially homestead land. Existing research has not reached a consensus. Qian(2021) suggested that high property income and low expected compensatory income of homesteads boost willingness to stay, while Liu (2019) proposed that homestead ownership does not significantly affect residence willingness but does reduce willingness to transfer hukou. Likewise, regarding the reform of the homestead system, the current research focus on discussing the future direction of reform instead of the effect of reform or the effect of reform on migrants' residence willingness.

3. RESEARCH METHODOLOGY

3.1 Data analysis introduction

In this article, the micro-data of the floating population we use comes from the "China Migrants Dynamic Monitoring Survey" project of the National Health and Planning Commission in 2017. Data on education and medical level and environmental conditions related to inflow cities are taken from Urban Statistical Yearbook in 2017. China Migrants Dynamic Survey (CMDS) is an annual large-scale national migrant population sample survey conducted by the National Health Commission since 2009, covering 31 provinces (autonomous regions and municipalities) and the Xinjiang Production and Construction Corps, with an annual sample size of nearly 200,000 households. It covers basic

demographic information of the floating population and family members, the scope and trend of mobility, employment, social security, income, expenditure, residence, essential public health services, marriage, children's mobility and education, family planning services management, and psychological culture. In addition, it also includes a survey on social integration and mental health of the floating population, health and family planning services in outflow cities, and medical health services for the elderly floating population. CMDS data is published on the floating population data platform, one of the five major information platforms built by the Floating Population Service Center of the National Health and Health Commission. Since 2014, this platform has undertaken the work of organizing and opening up the data of CMDS. More than 1.7 million samples and about 850 million data from the CMDS for nine years (from 2009 to 2017) have been standardized and organized, which are open to a society free of charge.

3.2 Research Model

To help interpret the empirical findings, researchers start by developing a simple logit model with the willingness of permanent residence and homestead ownership. Since the explained variable, the willingness of permanent residence, is binary, it is unwise to use a linear regression model. Based on McFadden (1973), we introduce the logical distribution model, taking the willingness of migrant workers to stay permanently as the dependent variable and homestead ownership in the household registration area as the independent variable. Besides the above two variables, other variables can disturb the outcome, like individuals' gender, age, education, income, environmental conditions, medical treatment of the city to which the mobile population is moving, etc. We take these into the control variables group.

Our model is given by the following equations:

$$\text{Logit}(p_i) = \ln\left(\frac{p_i}{1-p_i}\right) = \alpha + \beta_i X_i + \sum \gamma_i Z_i + \varepsilon_i,$$

Where p_i denotes the probability that for a given X_i , the corresponding individual makes a certain choice for this research, i.e., the probability that the migrant worker intends to stay in the local area. The parameter β_i and γ_i is estimated using the maximum likelihood estimation method. In general, β is expressed in terms of the odds ratio.

Suppose $P = \Pr(Y_i = 1|X_i)$, then $1 - P = \Pr(Y_i = 0|X_i)$, then $\frac{p_i}{1-p_i}$ denotes the odds ratio, and the estimate of β is to represent the value of the change in the probability of change in the explained variable caused by a small change in a value of the explanatory variable X_i .

3.3 Variables

3.3.1 Explained variables

There are three questions in the questionnaire of the CMSD regarding the intention of permanent residence: Question 1 "If you meet the conditions for local settlement, are you willing to move your household registration to the local area"; Question 2 "Do you plan to stay in the local area for some time in the future"; and Question 3 "If you intend to stay, how long do you expect yourself to stay local." Due to the special hukou system in China, it is difficult for people who do not have local household registration to enjoy local social welfare benefits, and most of the previous studies, therefore, assume that floating people will move their household registration into a place if they intend to stay there permanently, that is, they record those who answered yes in Question 1 as willing to stay permanently. This processing

method aims to exclude other external factors that may have an obstructive effect on household migration. However, in this data set, we find that some people are willing to permanently settle in the inflow city even though they answer no in the first question, i.e., they put "yes" in the second question and "settled" in the third question.

The reason for this phenomenon is partly because of nostalgia and homesickness, partly because they can get social benefits or give their children a better education by marrying a native. As a result, we select those who answer settled in Question 3 as willing to stay permanently.

3.3.2 Explanatory variables

The independent variable "Homestead ownership" refers to whether to have the right to use the residential land of the household registration. In this paper, we focus on the impact of home base tenure in the process of rural migration. Our paper focuses on the impact of residential land use rights in the process of rural migration, so the research sample is mainly rural migrant workers who have rural household registration and are currently living in cities. We use the questionnaire's response to "Do you have a home base in your hometown?" as an explanatory variable. Furthermore, the sample with the answer "do not know" was deleted.

3.3.3 Control variables

With reference to existing studies, we divided control variables into three different levels: individual, household, and city. It is worth noting that we also add homestead system reform as the control variable.

Gender, age, education, marital status, duration and scope of current migration, and local housing type are involved at the individual level. According to the age segmentation criteria proposed by the United Nations World Health Organization, we generate three age groups, one for the "Youth Group" aged no more than 44 years old, one for the "Middle-aged Group" aged between 45 and 60 years old, another is "Senior Group" aged more than 60 years old. Education is defined from 1 to 7 in the order of "No Schooling," "Primary School," "Middle School," "High School," "College Education," "Bachelor Degree," and "Graduate." There are 6 types of marital status: "Unmarried", "First Marriage", "Remarriage", "Divorce", "Widowed" and "Cohabitation". Housing type involves "Rent," "Government-provided Public Housing," "Purchase," and "Others."

Family monthly average income and expenditure and the number of families in inflow cities are controlled at the household level. The larger the local household size, the higher the degree of integration of the floating population with the inflow population, indicating a stronger desire to settle in the inflow city. Monthly household income and expenditure can reflect a certain extent of survival ability and living standard in the inflow city.

As for city-level characteristics, control variables include inflow city's hierarchy, average annual population, environmental condition (measured by PM2.5), per capita gross regional product, and an average number of doctors and schools (both primary and secondary). Hierarchy is categorized by "First-tier", "New First-tier", "Second-tier", "Third-tier", "Fourth-tier", and "Fifth-tier". In general, the better the inflow city develops, which implicates a larger number of doctors and schools and a lower level of PM2.5, the stronger the migrants' desire to stay permanently.

TABLE 1: DESCRIPTIVE STATISTICS FOR MIGRANT WORKERS, HOUSEHOLDS, AND INFLOW CITIES

Variable	No. of obs. (1)	Mean (2)	Std. dev. (3)	Min (4)	Max (5)
Willingness of permanent	119,597	0.352	0.477	0	1
Homestead ownership	119,597	0.701	0.458	0	1
Reform	119,597	0.00667	0.0814	0	1
Characteristics on individual level					
Gender	119,597	0.518	0.500	0	1
Age	119,596	36.14	10.66	15	96
Age group	119,597	1.254	0.493	1	3
Education	119,597	3.260	1.034	1	7
Marital status	119,597	1.958	0.672	1	6
Duration of current migration	119,596	73.88	71.80	2	770
Scope of current migration	119,597	1.677	0.759	1	3
Housing type	119,009	1.606	0.978	1	4
Characteristics on household level					
No. of families in inflow city	119,596	3.196	1.202	1	10
Family monthly income	119,592	6,814	5,177	-90,000	200,000
Log of family monthly income	119,235	8.652	0.585	2.996	12.21
Family monthly expenditure	119,591	3,524	2,645	50	100,000
Log of family monthly expenditure	119,591	7.974	0.626	3.912	11.51
Characteristics on City level					
Urban hierarchy	119,597	3.374	1.521	1	6
Average annual population	119,202	422.3	513.8	12	2,440
Per capital gross regional product	116,607	89,826	33,579	4,134	439,321
No. of secondary schools	119,520	17,557	19,768	16	83,928
No. of primary schools	119,520	17,296	19,289	31	84,905
Sum of secondary and primary	119,520	34,853	38,830	47	168,833
Average No. of schools	119,202	92.50	36.31	1.573	258.5
Average No. of doctors	114,196	45.70	15.83	7.404	88.53
PM 2.5	118,816	34.76	12.69	3.382	68.95

Notes. The table presents summary statistics for samples used in our analyses. Control variables include characteristics on individual, household level, and characteristics of migrants' inflow cities. For city characteristics, average number of schools is calculated by using sum of primary and secondary schools divided by population per 10,000, average number of doctors is calculated in a similar way.

4. EMPIRICAL STRATEGY

4.1 Introduction

In Section 3, we showed descriptive statistics for each control group separately. To formally quantify the impact of homestead ownership on the willingness of permanent residents, we pooled the data from all groups and tested for possible endogeneity using propensity score matching and the instrumental variable method. The results of our study show that homestead ownership significantly affects the floating population's willingness to stay permanently and negatively affects the willingness to permanent residence. This outcome passes the relevant endogeneity test.

4.2 Preliminary findings on logit model

Table 2.1 reports estimates of coefficient (β_i) based on full sample benchmark regression. The odds ratio reported in the last column of the table, which is calculated by, indicates the probability ratio on those with homestead ownership relative to those without. Similarly, the table shows that the estimated coefficient of homestead ownership in the household registration place is 0.709, which is less than one, i.e., the probability of having the intention to stay permanently for those who have the right to use the homestead is lower than that for those who do not have the right to use the homestead. It indicates that the right to use the homestead in the household registration place has a negative effect on the willingness of permanent residence for migrant workers. When adding the control

TABLE 2.1: ESTIMATED EFFECT OF HOMESTEAD ON PERMANENT RESIDENCE WILLINGNESS

Variable	Dependent variable: Willingness of permanent residence				Odds Ratio (5)
	(1)	(2)	(3)	(4)	
Homestead ownership	-0.339*** (-25.73)	-0.362*** (-26.50)	-0.344*** (-23.83)	-0.344*** (-23.81)	0.709*** (-23.81)
Reform				-0.292*** (-3.42)	0.747*** (-3.42)
Constant	-1.163*** (-31.08)	-2.299*** (-21.72)	-1.247*** (-5.37)	-1.247*** (-9.46)	0.285*** (-9.52)
R-squared	0.021	0.023	0.048	0.048	0.048
Characteristics on individual level	Yes	Yes	Yes	Yes	Yes
Characteristics on household level	No	Yes	Yes	Yes	Yes
Characteristics on city level	No	No	Yes	Yes	Yes
No. of Obs.	119,597	118,648	111,546	111,546	111,546

Notes. The first three columns are results of logistic regression, which gradually controls more variables. Variables on individual, household, and city levels are added into regression by group. The fourth column add reform indicator into the regression. The fifth column shows the odds ratio base on the fourth column.

variable – reform, although the correlation coefficient for β does not change (still), we can still conclude that reform also has a negative effect on the willingness of permanent residents.

TABLE 2.2: LOGISTIC RESULTS

Dependent variable: Willingness of permanent residence						
Variable	(1)	(2)	(3)	(4)	(5)	Odds Ratio (6)
Homestead ownership	-0.339*** (-25.73)	-0.342*** (-25.71)	-0.362*** (-26.50)	-0.356*** (-24.81)	-0.344*** (-23.81)	0.709*** (-23.81)
Gender	-0.031** (-2.54)	-0.060*** (-4.84)	-0.061*** (-4.87)	-0.043*** (-3.28)	-0.044*** (-3.39)	0.957*** (-3.39)
Age group	0.051*** (3.79)	-0.009 (-0.67)	0.018 (1.30)	-0.016 (-1.09)	-0.014 (-0.96)	0.986 (-0.96)
Education	0.181*** (28.72)	0.207*** (32.47)	0.187*** (27.93)	0.168*** (23.59)	0.173*** (24.16)	1.188*** (24.16)
Marital status	0.073*** (8.00)	0.064*** (6.86)	0.056*** (5.90)	0.060*** (5.93)	0.060*** (5.91)	1.062*** (5.91)
Duration of current migration		0.002*** (26.05)	0.002*** (24.99)	0.002*** (24.06)	0.002*** (23.94)	1.002*** (23.94)
Scope of current migration		-0.250*** (-30.10)	-0.229*** (-26.52)	-0.078*** (-8.17)	-0.073*** (-7.59)	0.929*** (-7.59)
Housing type			-0.045*** (-6.67)	-0.026*** (-3.60)	-0.025*** (-3.53)	0.975*** (-3.53)
No. of families in inflow city			-0.031*** (-5.28)	0.021*** (3.42)	0.023*** (3.67)	1.023*** (3.67)
Log of family monthly income			0.065*** (4.41)	-0.043*** (-2.72)	-0.046*** (-2.89)	0.955*** (-2.89)
Log of family monthly expenditure			0.130*** (9.36)	0.103*** (7.11)	0.105*** (7.14)	1.110*** (7.14)
Urban hierarchy				-0.143*** (-19.60)	-0.159*** (-20.26)	0.853*** (-20.26)
Average annual population				0.000*** (19.11)	0.000*** (17.49)	1.000*** (17.49)
Per capital gross regional product				0.000*** (6.59)	0.000*** (6.70)	1.000*** (6.70)
Average num. of schools				-0.001*** (-6.38)	-0.002*** (-7.69)	0.998*** (-7.69)
Average num. of doctors				0.006*** (10.74)	0.005*** (8.96)	1.005*** (8.96)
PM 2.5					-0.003*** (-5.37)	0.997*** (-5.37)
Reform					-0.292*** (-3.42)	0.747*** (-3.42)
Constant	-1.163*** (-31.08)	-0.894*** (-22.28)	-2.299*** (-21.72)	-1.470*** (-11.84)	-1.255*** (-9.52)	0.285*** (-9.52)
No. of Obs.	119,597	119,596	118,648	112,242	111,546	111,546

Table 2.2 reports the detailed estimates of coefficients on control variables (γ_i). Among

the individual properties, gender strongly affects the intention to stay permanently (in the dummy variable for gender, we set women to zero). The intention to stay is stronger for men than for women, which is different from the conclusion of previous literature. We explain it as men may face fewer mobility cost constraints. Increasing age significantly decreases the willingness to stay permanently. Education level significantly increases the population's intention to stay permanently, and the higher the education level, the higher the chance of having the intention to stay permanently. Marital status has a significant positive relationship with willingness to stay permanently, and housing type has a significant negative relationship with willingness to stay permanently. The longer the period of mobility, the stronger the desire to settle, indicating that due to the long-term residence, they have gradually adapted in terms of life and work, built more stable social relationships, and are more willing to stay in the local area. The scope of this movement is significantly and negatively correlated with the intention to permanent residence, which may be resulting from the migration of the population from some less-developed western regions to developed eastern coastal regions, where the attraction of their quality employment environment and the level of education and medical care outweighs the discomfort caused by the difference in culture and geography between the place of domicile and the place of inflow.

In terms of household characteristics, the effect of local household size on the intention to reside permanently is significant. This finding is consistent with existing literature and may be because family factors significantly affect the intention to reside permanently due to the development of transportation and communication facilities, which make communication between people more convenient. Monthly household expenditure positively affects the intention of permanent residence, which means that the larger the average monthly household expenditure, to a certain extent, means that the household has a higher standard of living in the local area and can afford the cost pressure of permanent residence. Hence, their intention of permanent residence is stronger.

In terms of city characteristics control variables, the higher the city level, the lower the population's willingness to stay permanently. This finding is the same as the current new trend of population mobility, in which the floating population is more willing to settle in new first-tier cities and second-tier cities due to the high cost of living and high-density population in first-tier cities. Especially for migrant workers, the cost of staying in economically developed cities is greater than the income gap, so their willingness to stay is lower. Besides, it is interesting to find out that inflow city's average annual population and per capita gross do not affect willingness to permanent residence. In addition, while the effect of the average number of schools and doctors and the city's environmental condition are all statistically significant, they are all economically insignificant.

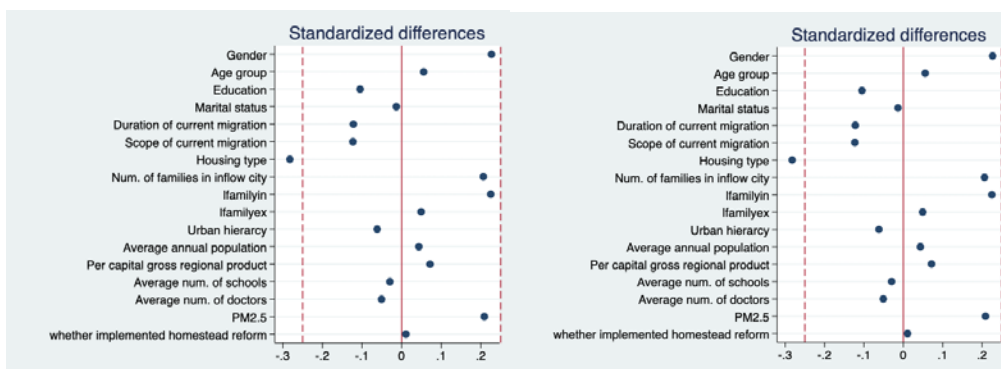
5. TEST

5.1 Introduction

A balance test found some balance issues between treatment and controls in this data set, which suggests that regression adjustment would rely on extrapolation. See figure 1.

5.2 Balance Test

FIGURE 1: Balance Test



There may be selection bias in the model setting in this paper. The main reason for this problem is that "having the right to use the residential land" is not randomly distributed, and various factors from individuals, families, and society are able to affect it, and they may act on both the explained variable and the core explanatory variables in this paper. As a result, it is impossible to judge whether the population without the intention of permanent residence already has the right to use the residential land in the household registration. The following parts construct a counterfactual framework, using propensity score matching to correct for selection bias.

In order to analyze the effect of the right to use the homestead in the household registration place on the intention to stay permanently, this article takes the sample with the homestead ownership as the experimental group and sample with other variables similar to the experimental group but without homestead ownership as the control group, then uses the individual data results to estimate the average treatment effect (ATT) of the experimental group samples. The specific results are obtained using both the least proximity matching method, and inverse probability weighted regression adjustment, as detailed in Table 3. the PSM results show that the homestead ownership has a significant negative effect on the intention to stay permanently.

TABLE 3: PROPENSITY SCORE MATCHING RESULTS

Method	ATT (1)	SE (2)	T-VALUE (3)
psmatch2	-0.0728***	0.0035	-20.61
ipwra	-0.0728***	0.0033	-22.02

5.3 Instrument variable method

Since there may be reverse causality between the explanatory variables and the explained variable, e.g., lower willingness to stay permanently in the local area may lead to having the right to use the homestead in the household registration area, this issue was ignored in the previous model. From the perspective of social consumption, returning to the hometown is a common form of consumption in China at present, and housing also appears in the form of cross-regional consumption, specifically in the form of flipping the building on the residential base etc.

In addition, there may be omissions in the selection of variables in this paper. This is

because the population's willingness to stay is not only an economic issue but also a sociological issue, with multiple and interacting influencing factors, which are influenced by other factors such as society and policy system, in addition to individual, family, and urban factors. Although the individual, household, and city variables are controlled for in the above analysis, they are not comprehensive enough and reflect the reality incompletely. There is still a probability of biased results. Therefore, to address the above possible problems, we use the instrumental variables approach for endogeneity testing.

For the selection of the instrumental variables of the "homestead ownership," we refer to Dujardin C and Goffettenagot F.'s working papers in 2009: "Does public housing occupancy increase unemployment," using the questionnaire data on "Did your parents have experience of working/doing business outside the household before you first moved?". Using "parental outflow" as the instrumental variable, if the respondent's parents had the experience of working or doing business outside the home, it largely indicates that the respondent's parents had left the home village, which in turn indicates that the probability of having the right to use the homestead in the home village is not high. According to the instrumental variables correlation and exogeneity requirements, the instrumental variables should be correlated with the explanatory variable but not with the explained variable, and parents' experience of working or doing business outside their home country meets this requirement.

We use a two-step estimation method, as shown in Table 4. The first step of the regression shows that parents' experience of going out of the home base is significantly correlated with homestead ownership. The second step of the regression shows that homestead ownership in the domicile has a significant negative effect on the intention to stay permanently.

TABLE 4: ESTIMATED HOMESTEAD EFFECT USING IV METHOD

		Variable					
		IV	Homestead	Constant	Control	Observations	R-squared
ivreg	First stage	0.040*** (-12.25)		0.805*** (-101.64)	-	116,955	0.023
	Two stage		-0.206** (-2.42)	0.574*** (8.20)	-	116,955	0.036
ivprobit			0.589** (-2.23)	1.216 (1.00)	-	116,955	0.023

6. CONCLUSION

This article reviews and compares domestic and international research on the demographic dividend, factors affecting population mobility, factors influencing the citizenship of migrant workers, and willingness to stay from a rural housing perspective. We investigate the relationship between rural migrant workers' homestead ownership and their willingness to stay permanently in the local area. By constructing an econometric model and using the propensity score matching method, we test the endogeneity of our model. Through the instrumental variable method, the sample is further classified and analyzed. In addition, control variables were conducted regarding city level, household level, and individual level.

The main findings are as follows.

1): At the national level, the right to use residential bases in household registration areas, i.e., homestead ownership, significantly reduces migrant workers' willingness to stay locally and permanently. It invariably creates a barrier to population mobility and the citizenship of migrant worker groups.

2): Considering the possible endogeneity problem of the model, this paper uses the propensity score matching method to test the data to correct for the selectivity bias. The results show that the right to use the home base in the household registration area has a significant negative effect on migrant workers' intention to stay permanently. In addition, this paper uses the instrumental variables method to test the model, and the results show that the instrumental variables are selected in accordance with the basic requirements of the setting of the instrumental variables, and the right to use the household registration site still significantly decreases migrant workers' willingness to stay permanently.

3): Based on control variables on the household level, we conclude that homestead ownership has a weakening effect on the willingness to stay permanently for households in different income brackets, and the weakening effect is strongest for low-income households.

The policy implications are as follows.

1): Since migrants are generally engaged in low-skilled jobs, they increase competitive pressure for similar workers in inflow-cities, leading to lower wage rates and worse living conditions for this part of the urban population. The homestead reform lowers the willingness to stay permanently for migrants, therefore, this condition will be alleviated and the negative impact will be partly reduced.

2): Rural homestead reform is conducive to revitalizing idle rural homestead, reducing the permanent residence willingness of migrants in cities, which is conducive to reducing rural brain drain, stimulating more migrants to return to home to start a business. This further promoted rural agricultural development, promoted agricultural innovation, for rural economic development to bring an endless power. Rural housing land reform is an important driver and engine for rural revitalization. By fully activating idle housing land and vacant rural houses, it will strengthen the collective economic strength of villages, increase farmers' property income, unleash the development potential of agriculture and rural areas, and help rural revitalization. In today's China, rural revitalization is an important development direction of the country. The reform of rural homestead is particularly important to promote rural revitalization and increase the innovative vitality of rural economy.

When it comes to the limitation of our analysis, we admit that we could only identify the causal relationship using cross-section data due to the deficiency of the data set. The questionnaire of CMDS differs every year, data in the previous year do not include all variables we need, such as county information and homestead ownership, so there are only 1-year data available. We are looking forward to exploring with DID method in our further research when the National Bureau of Statistics releases the latest CMDS data. Besides, some papers lag the city characteristic data by one year to avoid two-way causality. However, in our opinion, the variation of city characteristics within one year is kind of modest and will not have much influence on the result.

Appendix: HETEROGENEITY TEST BASE ON URBAN HIERARCHY, SCOPE OF CURRENT MIGRATION AND AGE GROUP

Dependent variable: Willingness of permanent residence										
Variables	Urban hierarchy				Scope of current migration			Age group		
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(1)	(2)	(3)
homestead	0.803*** (-4.67)	0.680*** (-12.24)	0.758*** (-12.61)	0.644*** (-14.08)	0.748*** (-13.59)	0.704*** (-14.15)	0.712*** (-9.64)	0.733*** (-19.17)	0.628*** (-13.20)	0.664*** (-4.76)
gender	0.855*** (-3.80)	1.01 (-0.36)	0.961** (-2.00)	0.967 (-1.15)	0.998 (-0.10)	0.912*** (-3.99)	0.965 (-1.10)	0.932*** (-4.74)	1.097*** (-2.95)	1.094 (-1.03)
agegroup	1.032 (-0.66)	0.877*** (-3.99)	1.02 (-0.87)	1.021 (-0.68)	0.999 (-0.06)	0.986 (-0.55)	0.982 (-0.50)			
education	1.270*** (-10.61)	1.132*** (-7.96)	1.217*** (-18.24)	1.107*** (-6.4)	1.219*** (-18.7)	1.149*** (-11.5)	1.151*** (-7.93)	1.207*** (-23.79)	1.053*** (-2.63)	1.102** (-2.07)
marital	1.084** (-2.41)	1.024 (-1.05)	1.077*** (-5.00)	1.026 (-1.10)	1.064*** (-4.56)	1.070*** (-3.52)	1.066** (-2.42)	1.047*** (-3.85)	1.107*** (-4.06)	1.057 (-1.45)
duration	1.003*** (-10.95)	1.002*** (-10.96)	1.001*** (-9.03)	1.001*** (-3.13)	1.003*** (-21.08)	1.001*** (-6.57)	1.000** (-2.03)	1.002*** (-19.99)	1.002*** (-11.95)	1.003*** (-6.54)
scope	1.199** (-2.37)	0.883*** (-4.88)	1.028** (-2.00)	1.050*** (-2.73)				0.936*** (-6.07)	0.917*** (-3.92)	0.814*** (-3.61)
housing	1.327*** (-9.39)	1.007 (-0.45)	0.935*** (-6.04)	1.021 (-1.48)	1.065*** (-5.8)	0.933*** (-5.75)	0.908*** (-5.95)	0.967*** (-4.01)	0.979 (-1.37)	0.964 (-0.97)
fam num.	1.005 (-0.26)	0.998 (-0.17)	0.998 (-0.21)	1.085*** (-6.27)	1.009 (-1.06)	1.035*** (-3.13)	1.026* (-1.65)	1.025*** (-3.38)	1.018 (-1.27)	1.107*** (-3.14)
lfam inc	1.083 (-1.64)	1.043 (-1.15)	0.943** (-2.43)	0.790*** (-7.22)	0.98 (-0.90)	1.003 (-0.11)	0.901*** (-2.65)	0.997 (-0.15)	0.902*** (-3.00)	0.826*** (-2.88)
lfam exp	1.386*** (-7.72)	1.058* (-1.74)	1.182*** (-7.45)	0.891*** (-3.59)	1.249*** (-10.96)	1.001 (-0.02)	0.864*** (-3.90)	1.103*** (-5.76)	1.114*** (-3.45)	1.148* (-1.87)
hierarchy					0.891*** (-10.25)	0.766*** (-19.26)	0.921*** (-3.21)	0.852*** (-18.03)	0.847*** (-9.26)	0.912* (-1.70)
avp	0.996*** (-5.14)	1.000*** (-4.13)	1.001*** (-17.08)	1 (-0.21)	1.001*** (-25.38)	1.000*** (-14.76)	1.001*** (-4.96)	1.000*** (-15.3)	1.000*** (-8.83)	1 (-1.11)
pcGRP	1.000*** (-8.59)	1.000*** (-8.59)	1.000 (-0.85)	1.000*** (-3.46)	1.000*** (-10.82)	1.000* (-1.84)	1.000*** (-7.32)	1.000*** (-5.24)	1.000*** (-3.33)	1 (-0.77)
anschool	1.018*** (-10.33)	1.003*** (-7.24)	1.004*** (-6.09)	0.999 (-1.22)	0.997*** (-7.89)	0.999* (-1.74)	1 (-0.54)	0.998*** (-8.16)	1 (-0.5)	0.998 (-1.05)
andoctor		0.975*** (-13.13)	1.001 (-1.1)	1.003*** (-2.68)	1.010*** (-11.51)	0.994*** (-5.57)	1.003** (-2.57)	1.005*** (-8.5)	1.005*** (-3.9)	1.002 (-0.5)
PM 25		1.026*** (-17.15)	0.987*** (-12.64)	0.992*** (-6.36)	1.003*** (-2.69)	0.984*** (-14.32)	0.989*** (-8.51)	0.997*** (-4.20)	0.996** (-2.48)	0.995 (-1.07)
reform	0.557** (-2.10)	0.511*** (-2.95)	0.931 (-0.59)	0.772 (-1.50)	0.732** (-2.56)	0.718** (-2.13)	0.819 (-0.99)	0.663*** (-4.17)	1.18 (-0.93)	0.591 (-0.85)
constant	5762057 (-5.79)	0.138*** (-6.81)	0.090*** (-12.49)	4.657*** (-6.05)	0.025*** (-19.67)	2.815*** (-4.46)	5.013*** (-4.51)	0.197*** (-10.96)	0.473** (-2.49)	1.054 (-0.08)

No. of obs.	12,111	23,730	49,352	26,353	56,454	34,891	20,201	86,616	22,029	2,901
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