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Residential Difference and Settlement Intention: Based on Ordered Logit Model

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Abstract

Based on the survey of the National Dynamic Monitoring of the Floating Population of China in 2014, this paper applies ordered logit model to present statistical evidence showing how residential difference can lead to variations in the probabilities of settlement of the floating population. The empirical results show that the residential difference is positively related to the settlement intensions of migrant workers. Specifically, the probability of settlement for the people who live in commercial housing is the highest, followed by those living in government subsidized housing and rental private housing, while those living in work unit housing is the lowest. Therefore, in order to promote the process of urbanization, we should respect migrants' settlement intensions and achieve the goal of their permanent settlement by improving the multi-level residential pattern and establishing a multiple security housing supply systems.

Keywords

Residential Difference, Settlement Intention, Ordered Logit Model

1. Introduction

Chinese famers, as the surplus labor in the rural area, have been migrating to cities to search for a better life start by 1980s, which has highly promoted the process of urbanization. As shown in the report of the National Survey on Migrant Workers in 2014 (NSMW 2014), there are approximately 274 million migrant workers in total on a national scale, among which the number of migrant workers leaving home is 168 million, accounting for a percentage of 61.4% [1]. With a large of rural people being forced into cities, the demands for accommodations in cities were skyrocketing during the pass decades. The housing provision, on the other hand, was unable to meet the explosion needs, which caused the housing problem. The evidence from the NSMW2014 showed that about 36.9% of migrants lived in rental housing, while 28.3% of migrants lived in collective dormitories provided by

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enterprises, especially the intensive labor firms. The percentage of other housing choices, including self-built sheds and temporary housing on construction site, added up to about 30%. The proportion of migrants who have purchased ownership right to their housing in urban or small town is minimal, merely about 1% [1]. In comparison with the local residents, the conditions of migrant housing in urban were at best mediocre, but most of them were obligated to endure these harsh situations [2]. And the existence of social exclusion leads the immigrants to have a limited possibility to own private house or get public rental house than the natives [3]. So how to settle down the migrant workers, housing problem seems to be a central topic among scholars. However, the differential in the housing choices seems to have crucial implication that the higher use right or ownership right on housing they got, the more resources their family may possess. But whether the housing choice plays a vital role in migrants' settlement intention, it has no empirical evidence before. So this paper is dedicated to testing the relationship between the residential difference and the settlement intention of migrants by employing empirical method.

The rest of the paper is organized as follows. Section 2 describes the data source and gives descriptive Analysis. In Section 3, we introduce the method we have used. Section 4 presents our empirical findings and Section 5 makes a conclusion.

2. Data Source and Descriptive Analysis

2.1. Data Source

The paper uses data from the survey on the National Dynamic Monitoring of the Floating Population of China in 2014 (NDMFP) conducted by National Health and Family Planning/Commission of the People's Republic of China. The data are collected from around 163,000 subjects between the age of 15 and 59 in 2014, who migrant to cities above one month. It provides plenty of household and individual information, such as demographic characteristics, migration destination, and work and employment information.

2.2. Descriptive Analysis

The purpose of this study is to test the relationship between the residential difference and the settlement intention of migrants. We suppose that the higher use right or ownership right on housing for migrants, the higher settlement intention they have. We measure the migrants' settlement intention by respondents' answer to the question: "Do you intend to live in this region for more than five years in the future?", and the answer to this question ranges from "Yes" and "Not sure" to "No". Answers to this question from the respondents to some extent reflect their migratory and settlement intention. Suppose the variable S is equal to 1 if the subject give the answer is "No", S = 2 if the answer is "Not sure", and S = 3 while the answer is "Yes". The way settlement intention is measured is important in empirical analysis because it considers all the situations including "Not sure" option, avoiding sample error. As can be seen in **Table 1**, the proportion of the answer "Yes", "Not sure" and "No" was 55.46%, 30.74% and 13.8% respectively. Up to half of them had a strong settlement intention.

Then we define the differential in the housing types as residential difference. Based on the housing provision mechanisms, they have been divided into four parts. The first one, subsidized housing with government support, including public housing, low-rent housing and economic and comfortable housing, is distributed by government. The second one is work unit housing, mainly provided by enterprises and businesses but also included temporary housing on construction sites. The third one is rental private housing provided by society, a popular option for migrants settling in suburban areas through the rental agencies, and the sitting tenants only have use rights. The last one is commercial housing which involved self-constructed housing and self-purchased housing, and migrants gain full right to sell and transfer. These variables are defined as binary variables. As shown in **Table 2**, renting was a key housing choice for migrants, accounting for a percentage of 65.85%, followed by

Table 1. The percentage of settlement intention.

S	Freq.	Percent	Cum.
1	22,540	13.8	13.8
2	50,210	30.74	44.54
3	90,587	55.46	100
Total	163,337	100	

Table 2. The Housing Types of The Floating Population.

Type	Mean	Std. Dev.	Min	Max
Work unit housing	0.1772	0.3819	0	1
Rental private housing	0.6585	0.4742	0	1
Subsidized housing	0.0102	0.1003	0	1
Commercial housing	0.1541	0.3611	0	1
Total	1			

working unit housing (17.72%) and commercial housing (15.41%), while the proportion of subsidized housing was merely 1%.

In addition, a preliminary analysis of the survey results revealed some important demographic characteristics and employment status of the respondents. Most of the respondents were middle age, and their mean age being 34 years. Male (59%) and female (41%) migrants were almost equally represented, and their mean educational years was 9.8, which was generally consistent with the implementation of the nine years compulsory education in China since 1990s. 76.23% of migrants had been married, 68.53% of among them went out together. The most common employment status of the respondents was self-employment (59.47%), followed by employee (27.25%), with 13.27% of unemployment also represented in the survey. Among the floating population, 15.51% of them were urban residents (see **Table 3**). In order to eliminate heteroskedasticity, we convert the variable of family income into logarithm.

3. Methods

In the classical econometric model, the dependent variables are usually assumed to be continuous variables. However, we always face many decision-making problems that people must make a decision in a number of alternative programs. Such programs can be represented by discrete variables. For example, the degree of settlement intention of the floating population is denoted by 1, 2 and 3. If using such explanatory variable to establish the econometric model, we call it discrete choice model, including binary choice model and multiple choice model. Multiple choice models can further divide into general multiple choice and ordered multiple choice model, and the latter one focus on the sequential options but the former not. Because of our outcomes can be ranked: the ordering S = 1, 2, 3 represents a ranking of settlement intention. Thus, this study should apply the ordered multiple model. Such model is involved in two kinds of multiple choice models-the ordered logit model and the ordered probit model. But ordered logit model, based on the assumption that the random disturbances are independently and identically distributed with the logistic distribution, which is the most widely used. Therefore, this paper will use the ordered logit model, which is:

$$y_i^* = \chi_i'\beta + \varepsilon_i \tag{1}$$

$$V_i = \chi_i'\alpha \tag{2}$$

What we can actually observe is the answer given by the respondent ***i***, in other words, is the discrete variable y_i (*i.e.* 1, 2, 3). But using discrete variable to be dependent variable will bring serious heteroscedastic and inconsistent error, so we convert it to continuous variables y_i^*. y_i^* consist of a set of identified items V_i and random items ε_i. V_i is a series of factors that affect the function of χ_i' and α is a estimated coefficient. We formalize the relationship between y_i^* and y_i as follow:

$$y_i = 1 \text{ if } y_i^* \le w_1$$
$$y_i = 2 \text{ if } w_1 \prec y_i^* \le w_2$$
$$y_i = 3 \text{ if } w_2 \prec y_i^*$$

where the threshold values w_1 and w_2 are unknown parameters to be estimated.

Table 3. Other control variables.

Variable	Obs	Mean	Std. Dev.	Min	Max
Demographic Characteristics					
Age	163,339	34.0707	9.3551	15	60
Female	163,339	0.4118	0.4922	0	1
Education year	163,339	9.8846	2.9826	0	19
Married	163,339	0.7623	0.4256	0	1
Log(Family income)	163,143	8.4962	0.5747	0	12.85
Migration Patterns					
Co-migrate	163,339	0.6853	0.4644	0	1
Migration time	163,339	4.6925	4.8451	0	50
Inter provincial flow	163,339	0.6269	0.4836	0	1
Inter municipality flow	163,339	0.3731	0.4836	0	1
Employment Characteristics					
Self-employment	163,339	0.5947	0.4909	0	1
Employee	163,339	0.2725	0.4453	0	1
unemployment	163,339	0.1327	0.3393	0	1
Property of household registration					
City citizens	163,339	0.1551	0.3620	0	1

4. Empirical Results

Our primary objective is to test the assumption that whether residential difference can lead to variations in the probabilities of settlement intention of the floating population. Model (1) controls for age, gender, years of schooling, marital status dummies and household income. Because of the differences in migration patterns (*i.e.* the scope and duration of migration, and co-migration dummies variable) and the property of household registration, we try to test the robustness of our results by introducing these detailed control variables into our regression (see Model (2)). Model (3) is the same as Model 2 except that it further controls for the employment status of migrants.

From **Table 4**, all of the variables in the equation are significant. The log likelihood function values from Model (1) to Model (3) are −142717.7, −137574.24 and −137427.89 respectively. Due to the value of settlement intention is gradually increased from 1 to 3, which means that the degree of settlement intention is from weak to strong. Therefore, the significant positive coefficient indicates that such immigrants have a stronger willingness to settle down the cities.

The effect of residential difference on settlement intention is captured by the first three dummy variables in **Table 4**. Taking the work unit housing as the control group, all of their coefficients are significant positive, which means that all types of housing availability have a positive effect on settlement intention. Meanwhile, the sequence of their coefficient is: Commercial housing > Subsidized housing > Rental private housing. It shows that migrants living in the commercial housing are more likely to stay in the cities in the future 5 years comparing to those living in the working unit housing. The result is consistent with our assumption that the more use right or ownership right on housing for migrants, the higher settlement intention they have. It is not surprising for this result, since once a migrant has gotten a house in urban, and it tends to tie down he/she to current location, known as housing lock effect, which will increase the cost of migration and then reduce the likelihood of moving. On the other hand, the differential in the housing choices seems to indirectly reflect the resources and capacity of individual possessed. In order to further test this result, we check the robustness of our results by

Table 4. Estimation results of ordered Logit model.

Variables	Model (1)	Model (2)	Model (3)
Rental private housing	0.2852*** (0.0125)	0.1246*** (0.0130)	0.1092*** (0.0132)
Subsidized housing	1.9356*** (0.0690)	1.6248*** (0.0704)	1.6355*** (0.0705)
Commercial housing	2.7291*** (0.0275)	2.2886*** (0.0281)	2.2950*** (0.0283)
Log(Family income)	0.5121*** (0.0104)	0.4283*** (0.0108)	0.4145*** (0.0108)
Age	0.0087*** (0.0007)	−0.0015** (0.0007)	−0.0025*** (0.0007)
Female	0.0616*** (0.0104)	0.0300*** (0.0106)	0.0557*** (0.0108)
Education year	0.0334*** (0.0019)	0.0368*** (0.0020)	0.0377*** (0.0021)
Married	0.4057*** (0.0142)	−0.3383*** (0.0215)	−0.3365*** (0.0215)
City citizens		0.1094*** (0.0163)	0.1204*** (0.0163)
Co-migration		0.8735*** (0.0194)	0.8569*** (0.0195)
Duration of migration		0.1108*** (0.0014)	0.1100*** (0.0014)
Inter municipality flow		0.2397*** (0.0110)	0.2355*** (0.0110)
Self-employment			0.1049*** (0.0165)
Employee			0.2816*** (0.0182)
Threshold			
W_1	3.7780***	3.1033***	3.0876***
	(0.0875)	(0.0914)	(0.0917)
W_2	5.5633***	4.9811***	4.9683***
	(0.0881)	(0.0919)	(0.0923)
Log likelihood	−142,717.7	−137,574.24	−137,427.89

Standard errors in parentheses: $^{*}p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$.

controlling the migration patterns and the employment status (see Model (2) and Model (3)), which is an extra supportive evidence to prove the above findings.

We provide brief comments on the effects of the other control variables on the probability of settlement intention. The gender and educated years of migrants are always found to have some positive effect on settlement intention. However, although marital status and age turn to increase the probability of settlement intention known by Model (1), in columns 3 and 4 of **Table 4**, we find married and older people tend to be less likely settle down in the cities as controlling the variables of migration patterns and employment status. The possible reasons are that Chinese traditional culture encourages older people to track back to their original destination, and the settlement intention of married people may be influenced by their partner. With regard to migration patterns, the results testify that the duration of migration have a positive effect on settlement intention, on the other hand, the

probability of settlement for the co-migrated couple is higher than the separated couple, known by Model (3). We also find that the employment status, the property of household registration and household income are positively related to settlement intention.

5. Conclusions

We estimate ordered logit model on the data of the National Dynamic Monitoring of the Floating Population of China in 2014 to test our assumption that the higher use right or ownership right on housing for migrants, the higher settlement intention they have. All empirical results are statistically significant and consistent with our prediction. Additionally we have introduced extensive sets of control variables to check the robustness of our results, and they have provided some extra evidences to support our finding—the residential difference is positively related to the settlement intensions of migrant workers. Specifically, the probability of settlement for the people who live in commercial housing is highest, followed by those living in government subsidized housing and rental private housing, while those living in working unit housing is lowest. However, due to lacking longitudinal data, we use the subjective variable-settlement intention to replace the real settlement situations, which may be a limitation for our paper.

Therefore, in order to promote the process of urbanization, several concrete measures should be implemented. Firstly, establishment of multiple ladder housing patterns is the best way, for example, building moderate low-rent housing to low income migrants, providing some affordable housing to middle-income migrants and encouraging well-paid migrants to purchase house through market mechanism. Secondly, to establish a perfect alternative multiple housing provision system that helps migrants to obtain an accommodation more easily in urban China, exerting the financial power to explore diverse housing construction channels. Finally, establishment of housing provident fund system for the city's floating population enhances their purchasing ability to pay commercial housing in market.

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