The Research on Determinants of Moving Labors' Settlement in Urban Area

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Abstract Based on the analysis of the factors affecting the migration of moving labor and the explanation of becoming permanent urban residents, this research takes migration mode (*migration*) as the dependent variable, sex (*sex*), age (*age*), monthly income (*income*), education degree (*edu*), working experiences (*exp*), social relation (*relation*), and social security (*security*) as the independent variables. According to the investigation of China Agricultural University in the year 2009, Logistic Binary Choice Model is used to construct the corresponding econometric model and to measure the effects of influencing factors on the selection of migration mode. Result shows that education degree, personal ability, social relation, and social security are the major influencing factors determining the peasant households becoming permanent urban residents; and human capital and social security construction are of great significance to the improvement of farmers' income and life quality.

Key words Settlement in urban area, Moving labor, Human capital, China

The issue of the moving labor living in cities is essentially a problem of rural surplus labor force transfer in rural areas. According to the international experience, the flow and residing behaviors of labor force usually happen together[1]. However, due to the development strategy of "industry priority" and the special system background of the household registration as the core, the urban-rural dual social structure in China shows typical double-rigid, so that the transfer of rural labor force in China shows the characteristics which are different from other regions and countries[2]. And the social group of "moving labor" is formed. In recent years, there is a growing scale of moving labor. At the end of the year 2010, the total number of farmers has reached 242 million in China. As for the selection of urban settlement mode, there are two modes of the family migration mode and the non-family migration mode. In other words, moving labors become the permanent urban residents, which reflects the moving labor demand for non-income factors, such as the social relation, children's education, family sentiment and responsibilities. And the "chain migration" effect has greatly affected the urbanization process and the urban-rural integration development. In the non-family migration mode, the migrant is mainly composed by the people with high education level and ability (positive migration), which will bring the accumulated human capital and social relations back to rural areas and will promote the social and economic development of rural areas. But the negative migration will further enlarge the level of economic and social development. Therefore, researches on the selection and influencing factors of farmers' becoming urban residents can determine the breakthrough of dual economic and social structure and the realization of the coordinated development of urban and rural areas.

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1 Research review

1.1 Influencing factors of moving labor becoming urban residents At present, the academic circles, at a microscopic level, mainly investigate the decision-making of moving labor becoming urban residents from the following aspects:

1.1.1 Economic factor. Todaro put forward the theory of expected income based on the theory of dual economic structure, and believed that the differences between urban and rural expected income was the basic strength determining the moving labor migrating into cities[3]. Stark *et al.* used the concept of relative income to establish the hypothesis of relative poverty, pointing out that the peasant households, who thought that their economic status declined compared with the local income level had relatively more migration motives[4]. Based on this, scholar Cai Fang carried out a series of empirical studies in the years 1996 and 2002 and argued that the decision-making of moving labor migration in China was in fact resulted from the hypothesis of expected income gap and the relative economic status[5].

1.1.2 Social factor. It mainly includes the two aspects of social relation and social security. On the one hand, Zhao Yandong pointed out that the social relation reduced the basic information of the urban and rural migrants and greatly determined their income and status in cities[6]. Related researches show that farmers with more social relations can obtain better career opportunities and have greater ability of living in cites[7]. On the other hand, based on the empirical study on the rural labor force in developing countries, Stark argued that the establishment of insurance market and the insurance programs related with the government had significant impact on the population transfer. And the social security of moving labor have improved their ability to resist urban risk and have helped them to make decisions about migration[4].

1.1.3 Individual factor. Based on a series of researches,

Zhao Yaohui believed that the probability of female urban residents was smaller than that of male; the married workers had relatively high migration cost (cash cost and psychological cost), which reduced the probability of migration. There are no significant relationships between the age and the transfer decision; but the education degree affects the transfer to non-agricultural industry but not the urban settlement[8]. Besides, Schwartz believed that relatively high education level reduced the psychological cost of migrant, enlarged their information, and enhanced the probability living in cities[9].

1.2 Interpretation for moving labor giving up becoming permanent urban residents Domestic and foreign scholars have different views on the phenomenon of moving labor giving up becoming permanent urban residents and returning back to rural areas. Stark put forward three explanations for the labor force return. Firstly, they can not find better paid work in cities. Secondly, compared with the cities they live, labor forces can find higher rate of return on human capital in the native place. Thirdly, native place has lower living cost than the urban areas[4]. According to the research on labor return in China, Zhao Yaohui uses the investigation data in 6 cities and provinces in the year 1999 to find out the reasons of labor return. According to the thrust forces, market segmentation of urban labor forces has caused the relatively low return rate of human capital of moving labor. According to the pulling force, the separation from family has produced psychological cost[10].

2 Variable selection, data source and research method

2.1 Research on variable

2.1.1 Dependent variable—selection of migration mode. This research divides the urban migration mode into "family migration mode" and "non-family migration mode". The "family migration mode" must meet the two conditions of "permanent migration" and "migration of all family members". And the mode selection is assumed as ① returning home after several years working outside and not going outside; ② returning home after becoming old; ③ depending on circumstances, looking for opportunities to settle with his family in the city; ④ living with his family in the city now and for a long time. The former two samples are assumed as the "non-family migration mode" and the dependent variable is 0; the latter two samples are assumed as the "family migration mode" and the dependent variable is 1.

2.1.2 Independent variable. According to the previous studies, Table 1 reports the variables based on the factors of personal feature, economic income, social relation and social security. As for the income variable, according to the hypothesis of relative income, relative monthly income, that is the difference between urban monthly income and rural monthly income, is used as the statistics. As for the education variable, the knowledge and ability cultivation in different education levels shows a leapfrog change. It is assumed that education variable (*edu*) refers to education degree, not the education years[11]. In other words, primary school is 6 years, junior middle school is 9 years, high school and technical secondary school are 12 years, and university is 16 years. As for the variable of social relation (*relation*), statistics of all the relatives, friends, and fellow-villager of moving labor in cities are carried out according to the survey results. Assuming that the period of resident for a relative of respondent j in cities is w_i years, its weight is $k_i = w_i / \sum w_i$ and the social relation of respondent j is $\sum k_i$.

Table 1 reports that most of the moving labors interviewed select the "family migration mode". In other words, they prefer to live permanently with their family in cities. The male and female samples are all at the age of 30 with the monthly income, which is 3 473.3 yuan higher in cities than in rural areas, but there is great gap in their income. They are mostly graduated from junior or senior high schools and their working experiences are mostly about 7 years with abundant social relation. There are few moving labors having social security but the proportion is still higher than that in the year 2010 (17.6%).

Table 1 Selection of variables and their meanings

Variable	Mean value	Variation coefficient	Meaning
migration	0.694 341	1.868 105	"*migration*=1" is "family migration mode"; "*migration*=0" is "non-family migration mode"
sex	0.568 372	1.429 701	"*sex*=1" is male; "*sex*=0" is female
age	29.938 750	2.394 502	Age
income	3 473.305	1.678 978	Relative monthly income
edu	9.772 124	1.441 041	Education degree
exp	7.232 651	1.061 306	Working experience
relation	26.001 26	0.507 334	Social relation
security	0.228 92	0.337 371	"*security*=1" is having social security; "*security*=0" is no social security

2.2 Data source Data are from the investigation of China Agricultural University, which is finished in January 2011. The investigation sites are distributed in Beijing, Wuhan City of Hubei Province, Hangzhou City of Zhejiang Province, Xian City of Shaanxi Province, and Zhongshan City of Guangdong Province. The sampling method is hierarchical sampling according to the map sampling frames. The respondents in the investigation are all moving labors living in cities for more than 2 years with relatively stable work, income and residence. Each respondent represents a family, that is, any two respondents are from two families. A total of 800 questionnaires are sent out and 765 questionnaires are retrieved. And 721 questionnaires were available. The industry distribution of respondents is 16.8% in building industry, 41.3% in service industry, 17.5% in processing manufacturing industry and 24.4% in private industry.

2.3 Research method According to the Discrete Choice

Analysis Theory and the previous studies on moving labor willingness becoming urban residents, Logistic Binary Choice Model is used to construct related econometric model and to measure the impact of influencing factors on settlement mode. Assuming that P is the ratio of family migration mode, 1-P is the ratio of non-family migration mode. Hence, we have the regression equation:

$$\log itP = \beta_0 + \sum_{i=1}^{n} \beta_i X_i + \omega \quad (1)$$

Except the basic variables mentioned above, proxy variables should be found out which reflect the ability of migrant workers. Because it is very difficult to measure the variable "ability", measurable data should be used to deduce the representative variables of varies abilities. According to the method of Hare[12], wage income of moving labor is estimated by Mincer standard human capital income equation[13]. Then, equation residual is used as the proxy variable of the ability of moving labor. In the equation, monthly income is converted into the income of hour[14], denoted by variable y. According to the standard human capital income equation, we have

$$\ln y = \partial_0 + \partial_1 \times sex + \partial_2 \times edu + \partial_3 \times exp + \partial_4 exp^2 + e_1 \quad (2)$$

The residual sequence obtained is used as the representative variable of ability variable in equation (1). And the final model estimation form is obtained.

3 Result and analysis

3.1 Descriptive analysis In order to investigate the basic differences of moving labor under two different migration modes, samples are divided into two groups according to the willingness of migration mode. Table 2 reports the descriptive statistics results of explanatory variables in two sample groups.

Table 2 Results of descriptive statistics under the two migration modes

Variable	(*Migration* = 1) Family migration mode		(*Migration* = 0) Non-family migration mode	
	Mean value	Variation coefficient	Mean value	Variation coefficient
sex	0.533 576 5	1.146 668	0.527 239 7	1.112 499
age	27.982 03	3.809 921	34.762 19	3.182 230
income	5 123.741	1.497 439	4 217.635	1.079 198
edu	11.810 6	5.214 091	8.986 3	2.746 767
exp	5.879 211	1.277 276	8.284 931	1.151 286
relation	35.734 82	1.166 467	21.267 41	0.444 687
security	0.302 821 3	0.718 007	0.272 095 4	0.586 683

Table 2 reports that moving labor selecting the family migration mode show higher values of education level, income level, and social relation than those selecting non-family migration mode; but the former is higher in age and working experiences than the latter. Whether there is causality between the settlement selection and these factors or not needs further determination during the following econometric model analysis.

3.2 Empirical analysis of model Variables in Table 1 are selected. According to the equation (1), equation (3) is obtained. In the Logistic multiple regression analysis, dependent variables are the will of moving labor selecting the migration mode (family migration mode = 1; non-family migration mode = 0). Bringing the independent variable into regression model, residual sequence of equation (2) is obtained and is used as independent variable in equation (3):

$$\log\left(\frac{P_i}{1-P_i}\right) = \beta_0 + \beta_1 \times sex + \beta_2 \times age + \beta_3 \times income + \beta_5 edu + \beta_5 \times exp + \beta_6 \times relation + \beta_7 \times security + \beta_8 \times e_1 + e_2 \quad (3)$$

where P_i is the ratio of family migration mode. Table 3 reports the regression and test results.

Table 3 Logistic regression analysis of the migration mode selection of moving labor

Explanatory variable	Model 1	Model 2	Model 3	Model 4
sex	0.290*	0.213**	0.252**	0.560*
age	−0.267***	−0.317***	–	–
income	0.688***	0.736***	0.638***	0.612**
edu	0.516***	0.509***	0.481**	0.393**
exp	−0.194*	–	−0.262*	–
relation	0.239**	0.187***	0.205**	0.309**
security	0.339***	0.431***	0.534***	0.421***
Capacity	0.523***	0.561***	0.498**	0.462**
Constant value	−9.970***	−8.048***	−9.028**	−10.778**
H-L statistical value	3.074 3***	2.981 3***	1.777 9***	0.222 5***
Statistical value of likelihood ratio index χ^2	46.239 1**	47.574 8**	47.576 9**	47.590 3**
Probability value of likelihood ratio index	0.000 3**	0.000 2**	0.000 2**	0.000 2**

Note: *, ** and *** mean $P<0.1$, $P<0.05$ and $P<0.01$, respectively.

According to the modeling criterion, all the explanatory variables in theory are put into the equation to carry out regression analyses. Then, the number of independent variables is gradually reduced according to the estimation and test results, so as to obtain the final model and to achieve the random and simple model estimation results. In order to avoid the biased estimation coefficient caused by the omission of important explanatory variables, the four models mentioned above are obtained to carry out test and analysis.

Firstly of all, we carry out the test analysis of the model overall fitting. According to the test results of H-L model, H-L statistical values of the four models are relatively small under 1% significance level. Thus, the fitting degree of model is relatively high. However, according to the results of likelihood ratio test, the probability values of likelihood ratios of the four models are all smaller than the 0.05 boundary value under 1% significance level. Therefore, it is regarded that there is certain significance between the independent variable and the dependent variable in the four models. Then, the significance test on the explanatory variables is carried out. The likelihood ratio test method is used to test the redundant explanatory variables in model 1. Result shows that there is redundancy in the variable of working experiences in model 1, but there is no redundancy in the variable of age. Model 4 has neglectd the variable of age. Thus, model 2 is used as the final model to carry out analyses. Since the estimated coefficient of binary choice model can not be explained as the marginal effect of dependent variable, forecast fitting index $x'_i\hat{\beta}$ should be calculated and to obtain the conditional probability marginal effect of a certain variable: $\partial E(y|x, \beta)/\partial x_j = f(-x'\beta)\beta_j$. Table 4 reports the marginal

effect of explanatory variables in model 2.

Table 4 The marginal effects of explanatory variables in model 2

Explanatory variable	Marginal effects	*t* statistics
sex	0.352	2.337
age	-0.389	3.318
income	0.818	6.172
edu	0.791	8.776
relation	0.253	5.297
security	0.41	5.561
Capacity	0.772	7.816

Table 4 reports that income factor still plays a significant role in the selection of migration mode of moving labor. According to the age factor, the willingness of " family migration mode" decreases with the increase of age, because the young moving labors have relatively weak local consciousness and pay more attention to the treatment of urban life, such as the improvement of social status and the future development. However, the elder moving labors are attached to native land and are unwilling to leave it. Thus, most of them return back to rural areas. Besides, education factor and ability factor have also played a very significant role, indicating that living in cities permanently is a positive selection process for the ability, education and social security. moving labors with higher education level and ability are more willing to seek for higher level development of individuals and families, so they are more likely to select the " family migration mode". The factor of social security also has significant positive influence, indicating that the social security has greatly promoted the permanent migration behavior as an important factor ensuring the quality of urban life and the status of economic society.

The factors of sex and working experience play an insignificant role in the selection of migration mode. As for the sex factor, moving labor have to consider the problems in living in cities with wife or the whole family during the selection of " family migration mode". As for the factor of working experience, it has multicollinearity with the age variable and is insignificant. Besides, as for the moving labor with relatively low education level and poor urban social foundation, they are mostly employed in the physical work with low value added. Therefore, the accumulation of working experiences can not help to increase their human capital, improve their personal capacity, or significantly enhance their economic and social status.

4 Conclusion and discussion

(1) The problem of moving labors settling down in cities is in fact a problem of the urbanization of moving labors, which is the second stage of the non-agricultural transformation of rural surplus labor force. Different from the " one-step transformation theory" of urbanization in other countries, peasants settling down in cities in China needs at least two stages[15]. The problems in the second stage are more than the economic factors in the first stage, which include the economic and social demands at higher level, such as social security and respect. According to the investigation results, moving labor are more willing to select the " family migration mode", and their education level, ability, and social relation show relatively high positive effects. According to the human capital theory, education is regarded as the most effective means to accumulate the human capital and to improve the income level. Therefore, it is obvious that there are differences among individuals with heterogeneity opportunity and ability during the long-term income. All these lead to the improvement of the economic status of moving labor. And they finally select the " family migration mode". Besides, improvement of education level helps to enhance the comprehensive quality of moving labor in law and society, so that moving labor can better deal with the affairs in urban life and can adapt to the urban life and development. Therefore, government should strengthen the education popularization of rural areas and the professional skills training of moving labor, improve their cultural qualities and professional skills, effectively enhance the income level, and improve their abilities to safeguard their rights and to seek for their own development.

(2) Income factor plays a relatively significant role in the selection of migration mode of moving labor. This indicates that the income factor, as the economic basis of urban life, is still the decisive force of the life quality, living environment and social status of moving labor and their families. Therefore, government should carry out in-depth reform including the household registration system, employment system, social security system, eliminate the barrier between the first class labor market and the second class labor market in China, ensure the rights of moving labor entering into the second class labor market at institutional level, and promote the market integration of dual system.

(3) During the migration process of moving labor, social security is an important condition ensuring the smooth development of becoming urban residents. Government should further care about the social security and rights of moving labor and their family members, reduce the resistance of moving labor during the flow in social class, avoid the solidification and marginalization of moving labor, enhance the social security of moving labor and their family members, set up specific power and responsibility departments, and avoid the blind zone of social security system.

(4) Moving labor with relatively high education level and abilities might work in the cities for a while and return back to rural areas to start an enterprise after accumulating certain human capital and social capital, which can accelerate the social and economic development of rural areas, and minimize the differences between urban and rural areas. However, due to the great differences between urban and rural areas in economic development level, social environment, and social security at present, moving labor returning back to rural areas will be restricted to a certain extent. Thus, government should encourage the peasants working in cities, improve the infrastructure of rural areas, enhance the employment and business environment, strengthen the human capital investment in rural areas, speed up the development of urban and rural integration, and avoid the further expansion of urban-rural gap.

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(From page 111)

industrialization process and promote development level of urbanization. In addition, we should consider the difference of natural geographic conditions, transportation location conditions and resources conditions and different urban economic basis; select different development modes; establish industrial spatial structure; foster development axis; elevate rapidly the economic development level and life standard of city so as to elevate the urbanization level comprehensively.

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