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Backflow of Migrant Workers in Urbanization: Place Selection and Influencing Factors

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Abstract Backflow of migrant workers is an essential part of rural surplus labor transfer. 425 valid samples from Haicheng, Taian and Xiuyan cities of Liaoning Province were analyzed and place selection and influencing factors were discussed. The study indicated that in backflow migrant workers, 43.16% returned to counties and towns, while 56.84% returned to rural areas. Place selection was significantly influenced by years of migrant work, training, times of migration, migration distance, age, land area in hometown, and living preference.

Key words Migrant workers, Backflow, Labor transfer, Place selection, Influencing factors

1 Introduction

Development experience of developed countries and classical theories of development economics indicate that orderly transfer of rural surplus labor between rural and urban areas is an inevitable path for realization of urbanization. Recent economic development practice of China also proves this conclusion. With gradual relaxation of the state in regulation of labor flow between urban and rural areas, rural flowing labors have become the mainstream in recent 30 years. According to the latest data issued by State Statistics Bureau, by the end of 2011, the number of migrant workers had reached 253 million, including 159 million going to cities and 94 million for local non-agricultural employment. Migrant workers in cities make great contribution to rapid development of urban economic development, but due to the household registration system, separation of urban and rural labor market, and social security system, migrant workers rarely enjoy public welfare of urban rapid development. As a result, there is flow of migrant workers.

The flow of China's rural surplus labor has changed from neither leaving farmland nor leaving hometown to the present leaving farmland and hometown. However, rural labor flow is not a linear movement. In the overall trend of rural to urban migration of labor, there also exists backflow of migrating labor. In other countries, rural labor transfer means two processes, moving out and settling down, to complete the process of urbanization. However, in China, even if rural labor can complete the first process, they do not want to settle down in cities. About 80% migrant workers of China stay the bird migration process, they flow in different cities or return to rural areas, or do short-time farming and then return to cities for work, so it is difficult for them to settle down in cities. According to survey of Han Jun and Cui Chuanyi^[4] about returning migrant workers in a hundred counties, the returning migrant workers have accounted up 23% of migrant workers. Ac-

cording to monitoring of State Statistics Bureau, in the beginning of 2009, due to influence of financial crisis, the returning migrant workers reached 70 million, accounting for 50% of total migrant workers. In the trend of industrial upgrade of southeastern coastal regions and movement of original industries to central and western regions, more migrant workers will choose to work in local or near places. This phenomenon can be partially proved by increasingly serious "shortage of migrant workers" since 2010. In the beginning of 2011, a lot of developed regions have the problem of "shortage of migrant workers", attracting high concern of scholars about Lewis turning point^[1-3]. Therefore, backflow of migrant workers has become a unique phenomenon of China in rural labor transfer. Where do migrant workers flow back? Which factors influence backflow of migrant workers? In this paper, we made an in-depth empirical study taking Haicheng, Taian and Xiuyan as an example.

2 Analysis framework

2.1 Concept definition

2.1.1 Migrant workers. With reference to definition of migrant workers put forward by other scholars, migrant workers possess following characteristics: (i) 16–60 years old and having rural household registration, including those obtaining urban household registration due to buying house or marriage, and also including those obtaining urban household registration due to loss of land in rapid urbanization; (ii) not receiving college and above education, but receiving secondary vocational education; (iii) grown up in rural areas, no life experience in cities, not including those having urban jobs due to leaving the army; (iv) working in cities not in rural local areas.

2.1.2 Backflow. Backflow is a term in chemical field, but it is gradually introduced into social field and represents a social phenomenon. In social field, backflow refers to people migrating to other places returning to original living place. In this study, the backflow is also population flow, *i. e.* migrant workers return to their hometown.

Generally, backflow of migrant workers has two types: migrant workers return to hometown for marriage, bearing child, and caring parents; migrant workers return to hometown because of no suitable job or for some family affairs. This includes returning to hometown for Spring Festival or busy farming season. But such short term backflow is beyond the scope of this study. Here, we mainly study permanent backflow of migrant workers.

2.1.3 Backflow migrant workers. At present, there is no exact definition about backflow migrant workers. Wang Xiyu^[10] defined backflow migrant workers as migrant workers returning to hometown after working in other counties for more than half year. In opinion of Huang Yuguo^[6], backflow migrant workers are farmers working in coastal regions for at least 4 years but returning to hometown for various reasons. Jin Sha^[9] held that backflow migrant workers should be limited to returning to areas below the county-level administrative system.

With reference to definitions of other scholars, we considered following three major points in defining backflow migrant workers: (i) conforming to requirements of migrant workers; (ii) returning to hometown more than 3 months (at least 3 months) and not willing to do migrant work any more; (iii) migrant workers returning to their local areas below the county level (*i. e.* towns or villages).

2.2 Division of backflow places From the beginning of the 1990s, some scholars started to concern about the migrant workers and study migrant workers from the perspective of undertaking of returning migrant workers and influence of returning migrant workers on rural economic society. Common premises of the above researches are migrant workers returning to rural hometown. However, in fact, some returning migrant workers do not return to rural areas but return to their local counties or towns. Therefore, we divided backflow places of returning migrant workers into counties and towns and rural areas.

(i) A major strategic task of future urbanization development is orderly promoting citizenization of agricultural migration people. But due to high cost of large and medium cities accepting agricultural migration people, major areas for realizing citizenization of migrant workers are in medium and small towns. Thus, dividing backflow place of migrant workers into counties and towns conforms to strategic requirements of future urbanization and citizenization of migrant workers.

(ii) In this study, we defined migrant workers as those working in other counties than their local counties. Therefore, samples in this study do not include migrant workers working in their local counties. We only consider migrant workers returning to their local counties or towns for various reasons after migrant work in other cities.

2.3 Factors influencing selection of migrant workers for backflow places There are many factors influencing selection of migrant workers for backflow places. Through overview of the past researches, we mainly consider following three factors.

Individual characteristics of migrant workers include sex,

age, educational level, marital status, social relation degree (whether relatives, friends or fellow villagers of migrant workers work in government, schools or hospitals, discrete variable), and living preference. Family characteristics include number of children younger than 6, number of the elderly older than 60, and land area in the family (before backflow of migrant workers). Characteristics of migrant work include years of migrant work, times of low, and migration distance.

2.4 Research methods When dependent variables have binary feature, residual error has the problem of heteroscedasticity, and it is impossible to guarantee estimated values fall in the unit interval, dependent variables can not satisfy hypothesis of regression analysis, and traditional regression analysis is not suitable. Logit model is developed in view of such defect. Compared with traditional analysis, Logit sample does not need to submit to normal distribution. Logit model is obtained from Logistic probability density function. If the variable t is stochastic variable of Logistic function, its probability density function will be:

$$f(t) = \frac{e^{-t}}{(1 + e^{-t})^2}, -\infty < t < +\infty \quad (1)$$

The distribution density function of stochastic variable is:

$$F(t) = p[T \leq t] = \frac{1}{1 + e^{-t}} \quad (2)$$

In sample i of Logit model, the probability of observing $y = 1$ is:

$$p_i = p[T \leq \alpha + \beta x_i + u_i] = F(\alpha + \beta x_i + u_i) = \frac{1}{1 + e^{-(\alpha + \beta x_i + u_i)}} \quad (3)$$

$Z_i = \alpha + \beta x_i + u_i$, the above formula can be changed into:

$$p_i = \frac{1}{1 + e^{-Z_i}} \quad (4)$$

$$1 - p_i = \frac{1}{1 + e^{Z_i}} \quad (5)$$

The occurrence rate of logistic regression:

$$\frac{p_i}{1 - p_i} = \frac{1 + e^{Z_i}}{1 + e^{-Z_i}} = e^{Z_i} \quad (6)$$

Take logarithm for each side:

$$\ln \frac{p_i}{1 - p_i} = Z_i = \alpha + \beta x_i + u_i \quad (7)$$

The above formula is the necessary Logit model function, expand independent variables to n -ary, we obtain general Logit regression model:

$$\ln \frac{p_i}{1 - p_i} = \alpha + \sum_{j=1}^n \beta_j x_{ji} + u_i \quad (8)$$

The formula (8) is the Binary Logistic Regression model, where p_i is the probability of i -th sample selecting pork quality certification signal, $\ln \frac{p_i}{1 - p_i}$ is logarithm of occurrence rate, and x_{ji} is the j -th variable of the i -th sample.

3 Data source

3.1 Description of sample selection Taking Haicheng City,

Taian County and Xiuyan County of Liaoning Province as sample regions, we studied backflow of migrant workers. (i) Related literature indicated that researches of backflow of migrant workers focus on Hubei, Anhui and Jiangxi provinces, few researches touched upon northeastern regions. Therefore, taking Liaoning Province as research region can increase research regions of migrant workers. (ii) According to economic development level and current economic development characteristics, choosing the above three areas has strong typical and comparable features. From the economic development level, Haicheng is in the first rank in Liaoning Province and is one of the 100 top counties (cities) of county-wide economy, Taian County ranks the medium level, and Xiuyan County is relatively backward. From the perspective of characteristics of current economic development, Haicheng is an economically developed city and its industrialization and urbanization are rapid, Taian County is a new developing county and the industrialization is also rapid, while in Xiuyan County, the employment opportunities are few because secondary and tertiary industries are not developed.

3.2 Organization and implementation of survey Surveyors: 10 postgraduates (3 doctors and 7 masters of the agriculture and forestry economic management discipline, four have experience of survey in issues of migrant workers) and 10 undergraduates. Undergraduates were selected through oriented recruitment, from Haicheng, Panshan and Xiuyan as much as possible, They were selected sophomores and juniors in the whole university voluntarily. Finally, 10 undergraduates with high language expression ability and communication ability were selected from the agriculture and forestry economic management discipline.

Survey implementation; this survey was implemented in cooperation with School of Business Administration, University of Science and Technology Liaoning. Firstly, we provided training for students of Haicheng, Taian, and Xiuyan. Then, we carried out survey on May 1, 2013. the average survey time of each county

and city was 5 days. To ensure questionnaire quality, we conducted self-checking and cross-checking on every night. For problems in the survey, we unified those inconsistent parts.

3.3 Survey method In this study, we adopted one-to-one interview method. With prior consent and understanding of respondents and giving respondents certain subsidy for work delayed, a surveyor interviewed a respondent. Surveyors asked questions and made related records and respondents answered questions. For some respondents, with their consent, we recorded the interview for checking questionnaire and ensure the survey quality.

3.4 Sampling methods We combined quota sampling and snowball sampling; each county (city) has 150 samples, including 50 non-returning migrant workers, 50 migrant workers returning to county (town), and 50 returning to rural areas. In the region, we considered industrial distribution of migrant workers as much as possible (including enterprises, service industries, and building industries). In the survey, we randomly selected samples and screened migrant workers, and asked them to recommend the next respondent. Finally we obtained 450 copies of questionnaire (425 ones are valid: including 191 non-returning migrant workers and 234 returning migrant workers).

4 Selection of backflow places

4.1 Distribution of backflow migrant workers As to regional distribution of backflow groups, the distribution of migrant workers returning to three sample regions is average (as shown in Table 1). Taian County has the highest percentage 38.34%. Haicheng City and Xiuyan County are close. But for migrant workers returning to rural areas, samples of Haicheng City are much more in Xiuyan and Taian counties, which are correlated with economic and social development level of three regions. Some migrant workers still want to do migrant work even if they are older than 60.

Table 1 Distribution of backflow migrant workers

	Haicheng City		Xiuyan County		Taian County		Total	
	Quantity of samples	Percentage	Quantity of samples	Percentage	Quantity of samples	Percentage	Quantity of samples	Percentage
Migrant workers returning to counties and towns	42	31.58	40	30.08	51	38.34	101	43.16
Migrant workers returning to rural areas	51	50.50	28	27.72	22	21.78	133	56.84

4.2 Reasons for selection of backflow places

4.2.1 Reasons for migrant workers returning to counties and towns. As to the question why migrant workers select local counties and towns, instead of other places, 102 respondents said they are close to their home or their spouse home, accounting for 76.69% of total samples, indicating that once migrant workers decide to return, they will mainly choose places close to their hometown, which is connected with 35.9% migrant workers are returning due to family reason. The second and third places are "there are many relatives and friends" and "friends have introduced this place to work", accounting for 7.52% and 6.02% of total samples, and

another 5.26% respondents return to the place because "there are many job opportunities and high wages".

4.2.2 Reasons for migrant workers returning to rural areas. There are three major reasons for migrant workers returning to rural areas. Firstly, they are familiar with rural life and want to live a steady life in rural areas, accounting for 45%. Secondly, it is convenient to look after the family (the elderly or children going to school), accounting for 35%. Thirdly, with issue of various preferential policies, rural environment gets improved, and more migrant workers want to return to rural areas for development or starting an undertaking. This is consistent with analysis of pulling

force of rural areas and their families to migrant workers. The pulling force is mainly manifested in familiar with and accustomed to life environment, family members needing caring, and improvement of rural development environment in recent years.

5 Factors influencing selection of migrant workers for backflow places

Table 2 Comparison of basic characteristics of two types of migrant workers

	All migrant workers		Migrant workers returning to counties and towns		Migrant workers returning to rural areas	
	Mean value	Standard deviation	Mean value	Standard deviation	Mean value	Standard deviation
Individual characteristics:						
Sex	0.67	0.47	0.58	0.49	0.78	0.41
Age//years of old	40.12	11.18	36.59	10.56	44.78	10.26
Educational years	8.27	2.32	8.74	2.17	7.65	2.37
Marital status	0.99	0.59	0.91	0.56	1.09	0.62
Social relation degree	0.48	0.50	0.47	0.50	0.50	0.50
Living preference	0.40	0.49	0.54	0.50	0.23	0.42
Family characteristics:						
Number of children younger than 6	0.25	0.47	0.24	0.46	0.26	0.48
Number of the elderly older than 60	0.18	0.49	0.14	0.48	0.22	0.52
Land area in the family	4.89	6.75	3.83	7.69	6.30	4.97
Migrant work characteristics:						
Years of migrant work	5.17	5.53	4.27	3.77	6.36	7.07
Training	0.29	0.67	0.38	0.81	0.17	0.38
Times of flow	1.82	1.10	1.65	0.94	2.04	1.26
Migration distance//km	515.21	1419.59	646.13	1840.99	342.79	410.88

Individual characteristics of migrant workers: as to the sex, more men migrant workers return to counties and towns, possibly because men migrant workers want to return to rural areas for agricultural production in consideration of traditional family concept and carrying on the agricultural production. The average of migrant workers returning to counties and towns is 36.59, obviously younger than those returning to rural areas. Since 90% migrant workers have get married, there is no big difference in this indicator between two types of migrant workers. Also, there is no big difference in social relation degree, indicating that social capital exerts little influence on selection of backflow places. There is great difference in living preference, the percentage of migrant workers returning to counties and towns preferring to urban life is higher than those returning to rural areas.

Family characteristics of migrant workers: the number of children younger than 6 is close in two types of migrant workers, while for migrant workers older than 60, those returning to rural areas are more than those returning to counties (towns), possibly because some migrant workers have to look after the elderly. Likewise, migrant workers returning to rural areas have 2.47 mu land more than those returning to counties (towns), indicating land area in the family will become a pulling force for migrant workers returning to rural areas.

Characteristics of migrant work: the average years of migrant

5.1 Comparison of migrant workers in different backflow places Through handling survey data, according to difference of backflow places, we divided samples into migrant workers returning to counties (towns) and migrant workers returning to rural areas, and made comparative analysis from individual characteristics, family characteristics and migrant work characteristics. The results are listed in Table 2.

work is 6.36 for migrant workers returning to rural areas, 2.09 years more than those returning to counties (towns), and flow times is also higher. Generally, frequent flow of migrant workers is not favorable for accumulation of working experience and social capital. As to training during migrant work, the percentage of migrant workers returning to counties (towns) receiving training is near one time higher than those returning to rural areas, indicating through training, the stock of human capital of migrant worker rises, which is favorable for their obtaining jobs or starting an undertaking in counties (towns). As to the distance from the last time job in the city, the average migration distance of migrant workers returning to counties (towns) is near one time higher than those returning to rural areas.

5.2 Logit regression results We adopted Logit regression and the estimation results are listed in Table 3.

In the regression process, it is required to firstly consider the influence of migrant work characteristics on selection of backflow places. From regression (1), we can see that years of migrant work, training, times of flow and migration distance are significant at 1%, 5% and 10% respectively, indicating the above variables have high explanatory function to selection of backflow places. Then, add the individual characteristics and family characteristics of migrant workers to the model and make regression, obtain the regression (2).

From overall estimation results of the model, although R^2 value is only 0.2327, Chi-Square value of LR and corresponding P value indicate that the model passes overall significance test and the accuracy rate of overall estimation is up to 75.21%.

(i) Migrant work characteristics: after adding the individual characteristics of migrant workers, the times of flow and migration distance are significant at 5% and 10% level respectively, indicating that both variables can better explain selection of backflow places; the coefficient of times of flow is negative, indicating that

the more times of flow, the more unfavorable for accumulation of working experience and accumulation of abilities, consequently influencing their employment in counties and towns, and the higher probability of returning to rural areas. The coefficient of migration distance is positive, indicating that the longer the migration distance, the higher probability of returning to counties and towns. Training and years of migration work may be not significant after controlling age and educational level of migrant workers.

Table 3 Estimation results of migrant workers selecting backflow places

Variables	Regression (1)			Regression (2)		
	Coefficient	Marginal effect	$p > z $	Coefficient	Marginal effect	$p > z $
Years of migrant work	-0.0751	-0.0183	0.005***	-0.0211	-0.0050	0.500
Training	0.9241	0.2121	0.003***	0.3474	0.0827	0.364
Times of flow	-0.3253	-0.0794	0.013**	-0.3638	-0.0866	0.015**
Migration distance	0.0005	0.0001	0.080*	0.0003	0.0001	0.077*
Sex				-0.2608	-0.0614	0.467
Age				-0.0629	-0.0150	0.001***
Educational level				0.0983	0.0234	0.209
Marital status				-0.1824	-0.0434	0.560
Social relation				-0.4670	-0.1109	0.157
Living preference				0.9958	0.2277	0.003***
Number of children				-0.3702	-0.0881	0.281
Number of the elderly				0.0498	0.0184	0.873
Land area				-0.0543	-0.0129	0.020**
- cons	0.4951		0.045**	3.0576		0.010***
LR χ^2		27.3500			74.4600	
Prob > χ^2		0.0000			0.0000	
Pseudo R^2		0.0855			0.2327	

Note: ***, **, and * denote significance at 1%, 5%, and 10% level respectively.

(ii) Other characteristics: the age is significant at 1% level and the symbol is negative, indicating that the higher the age before backflow, the higher probability of returning to rural areas, which is consistent with some migrant workers return to rural areas due to old age. The land area in the family is significant at 5% level and the coefficient symbol is negative, indicating that the more land area in the family, the greater pulling force for migrant workers, and the higher possibility of migrant workers returning to rural areas. Living preference of migrant workers is significant at 1% level and the symbol is positive, indicating that selection of backflow places is influenced by their individual preference. Those liking urban life may return to counties and towns, because counties and towns have similar characteristics of cities compared with rural areas.

6 Conclusions

We made an empirical analysis on 425 valid samples from Haicheng, Taian and Xiuyan cities of Liaoning Province. Our study found that 191 migrant workers are not returning, accounting for 44.94%; 234 migrant workers are returning, accounting for 55.06%. In 234 backflow migrant workers, 43.16% returned to counties and towns, while 56.84% returned to rural areas. The

Logit regression results indicate that years of migrant work, training, times of flow and migration distance have significant influence on selection of backflow places. The shorter years of migrant work, the higher probability of returning to counties and towns; migrant workers having received training are inclined to returning to counties and towns; migrant workers with less times of flow are inclined to returning to counties and towns; the longer the migration distance, the higher probability of returning to counties and towns. Age, land area in the family, and living preference have significant influence on selection of backflow places. The higher the age of migrant workers, the higher probability of returning to rural areas; the more land area in the family, the higher probability of returning to rural areas; those who like urban life prefer to return to counties and towns.

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rectly concerns national security. Maize price is greatly influenced by national policies and the effect of market in price making and resource allocation is not significant. In addition, the contribution of planting area to increase of maize yield is far higher than the per unit area yield, and scientific and technology level is still relatively low.

4.2 Policy recommendations (i) Grasp rules of changes in maize production pattern and optimizing maize production pattern. Due to overall influence of resource endowment, economic environment, market environment, technical conditions, and policies, China's maize planting is gradually centralized, and the production takes on "northern expansion and western movement" trend. However, in the whole country, there are still many areas not suitable for planting maize, which is not favorable for effectively use of resources. Therefore, it is recommended to formulate differentiated support policies, develop superior areas, and further optimize maize production pattern.

(ii) Strengthening infrastructure construction and creating excellent maize production environment. Initial pattern of maize production mainly relies on natural resources, but economic activities of all regions can improve and optimize production pattern. Therefore, strengthening construction of infrastructure such as capital farmland, water conservancy projects and irrigation can alleviate restriction of natural resources to maize production. Besides, improving field roads and inter-regional traffic network can facilitate maize production and circulation and realize organic combination of resource endowment and economic benefits.

(iii) Improving maize insurance system and stabilizing and promoting maize production. Agricultural insurance provides guarantee for agricultural production in the event of natural disasters and plant diseases and insect pests. It can decentralize and transfer losses of farmers and stabilize farmers' income. Besides, it can stabilize farmers' expected income, improve enthusiasm of farmers for planting, and promote agricultural production. Therefore, it is recommended to establish and improve effective maize production insurance, strengthen propaganda of agricultural insurance policies, stabilize maize yield, and promote maize production.

(iv) It is recommended to increase scientific and technological input, and increase the contribution rate to per unit area yield. In 2014, the per unit area yield of maize in China was 5.82 t/ha,

having a wide gap with 10.73 t/ha in the United States. Compared with mechanized maize planting and high per unit area yield in developed countries, like the United States, China is still relatively low in maize production mechanization, and the contribution of per unit area yield to the yield increase is very little. Therefore, it is recommended to strengthen scientific researches and speed up research and development of fine maize varieties of resisting drought and lodging, enhance scientific and technological extension, cultivate mechanized production, and increase the per unit area yield.

(v) It is recommended to encourage land circulation and realize mechanized production. Traditional extensive and decentralized operation is a major factor restricting China's maize production. Encouraging land circulation and guiding centralization of land to large planting households or cooperatives are helpful for realizing centralized and mechanized farming, reducing production cost, increasing production efficiency, and realizing economic benefits.

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