Empirical Analysis of Factors Influencing Surplus Labor Transfer in Poverty-stricken Areas：

A Case Study of Yimatu Town in Fuxin City

CHEN Shuang[1]，ZHANG Yan[2]，HU Li-jia[1]*

1. Southwest Forestry University，Kunming 650224，China；2. Shenyang Agricultural University，Shenyang 110866，China

Abstract　From the microscopic point of view，taking the surplus labor transfer in the Yimatu Town area as study object，we conduct survey of characteristics and transfer of rural surplus labor in Yimatu Town，through questionnaires and field interviews. Then we analyze the main factors influencing surplus labor transfer in rural areas from the personal characteristics of labor forces and family factor of labor forces. The results show that gender，age，educational level，farmland management days and other factors pertaining to the labor forces all affect the transfer of surplus labor，but the size and extent of the impact vary. In accordance with various influencing factors，we put forward recommendations for promoting the effective transfer of surplus labor in rural areas as follows：first，paying equal attention to macroscopic factors and microscopic factors influencing the transfer of surplus labor；second，focusing on the factors concerning the rural households and individual farmers，to find out the factors influencing the rational transfer；third，shifting the employment concept of surplus labor in rural areas；fourth，speeding up the construction of small towns and developing the secondary and tertiary industries.

Key words　Yimatu Town，Poverty-stricken areas，Surplus labor，Transfer

1　Overview of the study area

Yimatu Town is located in the southwest of Fumeng County，40 km away from the county，which is 10.4 km from east to west，15.5 km from north to south，with a total area of 93 km². A large portion of terrain in the town，high in west and low in east as a whole，is the vast plain，with fertile soil，largely producing grain and oil. In the town，that the area of arable land is 4 800 hm²，and the area of afforestation is 1 133.33 hm².

In Yimatu Town，the transportation and communications are convenient，Jinzhou-fuxin Expressway，Shugang Highway，and Fuyi Railway running across the town area from east to west. There are two passenger and freight railway stations，forming the transportation network interlinking highways，railways and village roads. It has 6.4 km tar coated road，completed in September 30，2003. There are 5000 program-controlled telephones in the town；8 villages have been equipped with computers；300 households have installed cable television in 5 villages.

14 administrative villages are under jurisdiction of the town，with a total of 8 025 households and 27 283 people，in-cluding agricultural population of 25 264. Within the town，the permanent population，mining population，and floating population reaches 50 000，forming a region where workers and peasants are mixed，with great population mobility. The major nationalities in the town are Manchu，Hui and other ethnic minorities.

2　Surplus labor transfer in Yimatu Town of Fuxin City

2.1　Labor flow in Yimatu Town　From 2004，Yimatu Town began to focus on farmers' non-agricultural employment problems，achieving the flow of labor between cities and provinces. The labor forces engaged in the non-agricultural employment in the city account for about 85%，and the labor forces flowing across cities or provinces account for about 15%. Town government determines the plan of labor outflow at the beginning of each year，and the actual total outflow of labor always exceeds the quota. Both the planned number of labor flowing out and the actual number of labor flowing out increase year by year （Table 1）.

Table 1　The outflow of labor in Yimatu Town during the period 2004 –2007

Year	The planned number of labor flowing out∥people	The actual number of labor flowing out∥people	Percentage of the actual number of labor flowing out∥%
2004	4 204	5 340	127
2005	4 941	5 298	107
2006	5 358	6 077	113
2007	5 758	6 477	112

2.2　Survey of surplus labor in Yimatu Town and the migrant experience　We select the sample in Yimatu Town as the analysis object，and select the relevant variables to analyze factors influencing Yimatu's farmers in the process of surplus

labor transfer (mainly the micro factors). There are 65 copies of questionnaires in total, calling back 61, and the number of valid questionnaires is 60. In valid questionnaires, the male has a proportion of 80% and the female has a proportion of 20%; 20 respondents have no migrant experience, and 40 respondents have migrant experience. The relationship between attribute property of the survey object and the migrant experience can be shown in Table 2.

Table 1   The relationship between attribute property of the survey object and the migrant experience ($N=60$)

Item	Property	Having no migrant experience		Having migrant experience	
		Frequency	Proportion//%	Frequency	Proportion//%
Gender	Female	5	25	7	17.5
	Male	15	75	33	82.5
Age	Below 20	0	0	2	5
	21 – 40	5	25	28	70
	41 – 60	11	55	10	25
	Above 61	4	20	0	0
Educational level	Illiteracy	1	5	0	0
	Primary school	6	30	4	10
	Junior high school	13	65	33	82.5
	Senior high school and above	0	0	3	7.5
The level of household income in local areas	Low	7	35	4	10
	Below average	1	5	9	22.5
	Average	3	15	19	47.5
	Above average	5	25	7	17.5
	High	4	20	1	2.5

2.2.1   Gender and the migrant experience. In all samples analyzed, there are 40 farmers having migrant experience, accounting for 66.67% of the total number of samples, including 33 men, accounting for 82.5%, and 7 women, accounting for 17.5%, as shown in Table 2. It can be seen that the proportion of the men having migrant experience is much larger than that of the women work elsewhere.

2.2.2   Age. There is also significant relationship between surplus labor transfer and the age structure. Table 3 shows that the age of people with migrant experience is mainly concentrated in 21 – 40; there are also migrant workers aged 41 – 60; for the groups of people over the age of 61, they almost have no ability to work outside the home.

2.2.3   Educational level. The impact of educational level on surplus labor transfer in rural areas is not very significant, because the vast majority of people aged between 21 and 60 graduate from junior high school, that's to say, the educational level of migrant workers is junior high school, but there is also a small number of highly educated people or the people with the educational level of primary school; the illiterates seldom work outside the home. Table 4 shows the composition of educational level and surplus labor transfer.

2.2.4   The level of household income in local areas. The survey results show that the vast majority of surplus labor forces working outside the home are from the ordinary rural households, while for the people without the migrant experience, the family income is often low. This can also explain some scholars' researches mentioned at the beginning of this article: in poverty-stricken areas, the surplus labor transfer is largely from the families with average income in the region; low-income rural households can not afford the cost of labor transfer; high-income rural households do not need to work outside.

2.3   **Outflow of rural surplus labor in Yimatu Town**   Questionnaire results of outflow of rural surplus labor in Yimatu Town can be shown in Table 3. Table 3 shows that the surplus labor forces in rural areas in Yimatu Town largely flow across the city, accounting for 42.5%; there are also many people crossing the county, accounting for 32.5%; only 10% of the surplus labor forces flow across the province. The survey data are consistent with the township government statistics.

Table 3   Questionnaire results of outflow of rural surplus labor in Yimatu Town

Outflow direction	Frequency	Proportion//%
Cross-township	6	15
Cross-county	13	32.5
Cross-city	17	42.5
Cross-province	4	10

3   Analysis of factors influencing surplus labor transfer in Yimatu Town

3.1   Model and variable selection

3.1.1   Model selection. We select Logit model to analyze these samples. The description of the model form is as follows. Let the farmers having the migrant experience be incident A, then the probability of occurrence of incident A is:

$$P_i(A) = e^{z_i}/(1 + e^{z_i}) \qquad (1)$$

$$\text{Then } e^{z_i} = P_i/(1 - P_i) \qquad (2)$$

where Z_i is linear combination model, that is, $Z_i = \alpha_0 + \beta_1 X_1 + \beta_2 X_2 + \cdots\cdots + \beta_n X_n$, where X_1, X_2, X_3, $\cdots$, X_n are all explanatory variables (Table 4).

Conducting Logit transformation on expression (2), and taking logarithm of both sides:

$$\ln[P_i/(1 - P_i)] = \alpha_0 + \beta_1 X_1 + \beta_2 X_2 + \cdots\cdots + \beta_n X_n \qquad (3)$$

where P_i is the probability of having the migrant experience; $(1 - P_i)$ is the probability of having no migrant experience; $P_i/(1 - P_i)$ is the ratio of the probability that one incident will occur to the probability that one incident will never occur.

The Logit model is applied to predict the probability of surplus labor in rural areas working outside the home.

3.1.2 Variable selection. Logit model is 0, 1 model, and the variable to be explained is whether surplus labor forces in rural areas have migrant experience (having migrant experience =1; having no migrant experience =0).

Explanatory variables are described in Table 4. Among the factors influencing surplus labor transfer in rural areas, we select 13 explanatory variables. In these 13 factors, gender, age, years of education, and whether to participate in training, are the personal characteristics of workers. The number of family labor forces, the number of the elderly aged more than 60 in the family, the level of household income in local areas, the area of land contracted by household, annual number of working days, the number of migrant workers in the family, and whether or not to subcontract land, are the characteristics of rural households.

Table 4 Description of explanatory variables

Variable	Variable explanation	Minimum	Maximum	Mean	std. deviation
Gender	Male =1; female =0	0	1	0.800 0	0.403 3
Age		18	70	38.450 0	13.506 3
Years of education		0	14	8.566 7	1.925 4
The number of family labor forces		0	4	2.333 3	0.837 0
Number of family members who go to school		0	2	0.533 3	0.566 4
The number of the elderly aged more than 60 in the family		0	2	0.416 7	0.719 9
The level of household income in local areas	Low =1; Below average =2; Average =3; Above average =4; High =5	1	5	2.833 3	1.195 5
the area of land contracted by household		0	35	7.495 0	5.509 3
Annual number of working days		0	360	303.750 0	87.887 7
The number of working days of operating agricultural land		0	60	13.100	13.392 0
The number of migrant workers in the family		0	3	0.883 3	0.666 1
Whether or not to subcontract land	No =0; Yes =1	0	1	0.100 0	0.302 5
Whether to participate in training	No =0; Yes =1	0	1	0.233 3	0.426 5

In terms of variable description, gender, whether or not to subcontract land, and whether to participate in training, adopt dummy variable form of 0, 1. The household income is also divided into five levels: 1 signifies the rural households with annual income below 5 000 yuan (low income); 2 signifies the rural households with annual income between 5000 and 10 000 (below average income); 3 signifies the rural households with annual income between 10 000 and 15 000 (average income); 4 signifies the rural households with annual income between 15 000 and 20 000 (above average income); 5 signifies the rural households with annual income above 20000 (high income).

In terms of the attitude of the government and villages, they all support the transfer of surplus labor in rural areas, so this factor has been automatically removed.

3.2 Model assumptions

(i) In the process of transfer of labor forces, the number of men is larger than that of women. Due to impact of traditional ideas, the number of male migrants is much bigger than that of the female migrants. As also described in the above table 2, gender will seriously affect the transfer of labor forces.

(ii) The factor of age also has important influence on the transfer of labor forces. In general, there are many young people going out to work, while the elderly and people aged below 20 seldom go out, because the elderly do not have the ability to work, and people aged below 20 are generally attending school.

(iii) The longer the years of education, the more opportunities there will be for labor transfer, the more the employment types for choosing.

(iv) If the number of family labor forces is great, there will be some people released from the agriculture, turning into surplus labor forces to be transferred out.

(v) If the number of family members who go to school is large, it will promote labor forces to work outside the home, because the costs of child's schooling are high.

(vi) If the number of people aged more than 60 is large, it will also promote the transfer of labor forces.

(vii) High-income families and low-income families are reluctant to work outside the home, and the households willing to go out are mostly concentrated in middle-income families.

(viii) If the area of land operated by the family is large, it will inhibit the surplus labor transfer, because the farmers have many land plots, then they will spend more time on the land, leaving little time for non-agricultural employment.

(ix) The annual number of working days has not much impact in general, because the people with the ability to work are always in the state of the labor, having not so harsh requirements on time.

(x) The number of working days of operating agricultural land will affect the labor force's working outside the home. If the number of working days of operating agricultural land is large, it will limit their behaviors.

(xi) The number of migrant workers in the family also plays a role in limiting farmers' non-farm employment behaviors. The possible economic behavior in one rural household is that some people go out for non-agricultural employment, while the remaining people are engaged in agricultural labor at home. Thus, the land will not be abandoned, and some people are

transferred out as surplus labor.

（xii）Whether or not to subcontract land is also a limiting factor. If the land is successfully subcontracted, then rural surplus labor forces will stay in the city engaging in non-agricultural employment for a long time, greatly reducing "labor reflow".

（xiii）The surplus labor forces in rural areas who have received training will have more transfer opportunities; on the contrary, the surplus labor forces in rural areas who have not yet received training will have few transfer opportunities, lacking competitive advantages in the market economy conditions.

3.3 Model estimation results We estimate the model using SPSS software, and the results can be seen in Table 5. Table 5 shows that the prediction accuracy rate of model is 83.3%, and Nagelkerke R^2 is 0.757, indicating that the fitting of the model is particularly good. Table gives the regression coefficient B, standard error SE, Wald statistic, significant degree sig, exponential Exp(B) and confidence intervals, respectively, of which, sig means the significant level of different variables under Wald test; Exp(B) is equal to the odds ratio, used to measure the change in the original odds ratio when there is one unit change in the explanatory variables.

Table 5 Logit model regression results

Variable	B	S.E	Wald	sig	Exp(B)	95.0% C.I. for EXP(B)	
						Lower	Upper
Gender	−0.871	1.976	0.194	0.659	0.418	0.009	20.139
Age	−0.199	0.098	4.083	0.043	0.820	0.676	0.994
Years of education	−0.610	0.542	1.267	0.260	0.543	0.188	1.572
The number of family labor forces	3.093	1.747	3.136	0.077	22.042	0.719	675.998
The number of family members who go to school	−0.487	1.327	0.135	0.714	0.614	0.046	8.274
The number of the elderly aged more than 60 in the family	3.165	1.776	3.177	0.075	23.686	0.730	768.904
The level of household income in local areas	−1.914	0.888	4.643	0.031	0.148	0.026	0.841
The area of land contracted by household	−0.495	0.351	1.985	0.159	0.610	0.306	1.213
Annual number of working days	0.048	0.031	2.398	0.122	1.049	0.987	1.115
The number of working days of operating agricultural land	−0.012	0.082	0.022	0.882	0.988	0.842	1.159
The number of migrant workers in the family	−0.491	1.041	0.223	0.637	0.612	0.080	4.704
Whether or not to subcontract land	−1.074	2.872	0.140	0.708	0.342	0.001	95.088
Whether to participate in training	0.613	1.617	0.143	0.705	1.845	0.077	43.926
Constant	0.972	10.241	0.009	0.924	2.643		

From Table 5, we can draw the following conclusions.

（i）Age and the level of household income in local areas pass the test, and the two factors have significant impact on the transfer of surplus labor in rural areas.

The impact of age and the level of household income in local areas on farmers' working outside the home is negative, and the older the age, the fewer the opportunities to work outside the home. It is also what we are usually able to understand. The higher the family income, the more unlikely for the labor forces to transfer. In local households with high income, they would feel no need to go out to work. Relatively, the households with low income would try by hook or by crook to obtain some non-agricultural income. As displayed in previous Tables 3, 5, there are more young people among the migrant workers, and their family income in local areas is mostly at middle level. Some scholars' research results show that the middle-income rural households in the poverty-stricken areas, are most probably engaged in cross-regional employment, because poor farmers can not afford the corresponding costs, such as fare and living expenses, while relatively wealthy rural households do not want to go out to work.

（ii）Under the 10% significance level, the number of family labor forces and the number of the elderly aged more than 60 in the family pass test, both having positive impact. In one family, the greater the number of labor forces, then the greater the possibility of working outside the home, that is, now for a family, it does not need too many agricultural labor forces, while for those households with surplus labor forces, they can transfer these labor forces out, engaging in non-agricultural production.

（iii）Gender, years of education, the number of family members who go to school, the area of land contracted by household, annual number of working days, the number of working days of operating agricultural land, the number of migrant workers in the family, whether or not to subcontract land, and whether to participate in training, do not pass the test. In rural areas, the impact of gender on transfer of rural labor force is no longer so obvious, because the labor forces transferred are mainly young people, whether male or female, having relatively open mind and the ability to engage in non-farm employment. The rural surplus labor forces are generally engaged in relatively dirty, chaotic, and tired work in the city, so the requirement on the level of education is not so obvious, and whether having participated in training is not so important to the promotion of surplus labor transfer. With the development and changes of economy in the poverty-stricken areas, the impact of some factors on surplus labor transfer is not significant, such as the number of family members who go to school, the area of land contracted by household, annual number of working days, the number of working days of operating agricultural land, and the number of migrant workers in the family.

4 Conclusions and recommendations

4.1 Conclusions The number of surplus labor transfer in rural areas, or whether the farmers work outside the home, is influenced by the macroeconomic factors, including institutional

factors，agricultural policies，market factors，and so on. People often attach great importance to these macroeconomic factors. At the same time，the impact of micro-factors also can not be ignored. Among them，gender，age，years of education ，the number of family members who go to school，the level of household income in local areas ，the area of land contracted by household ，the number of working days of operating agricultural land ，the number of migrant workers in the family，and whether or not to subcontract land，have a negative impact on labor force transfer，that is，they have a reverse effect on surplus labor forces' working outside the home，not conducive to the transfer of rural surplus labor forces. The number of family labor forces，the number of the elderly aged more than 60 in the family，annual number of working days，and whether to participate in training，have a positive impact on the transfer of surplus labor forces，that is，they have a positive effect on surplus labor forces' working outside the home，conducive to the transfer of rural surplus labor forces.

Age，the level of household income in local areas，the number of family labor forces，and the number of the elderly aged more than 60 in the family，pass the test. But the impact of some micro-factors is not significant，and this may be caused by regional differences.

4.2　Recommendations

（ⅰ）From the perspective of entire province，paying equal attention to macroscopic factors and microscopic factors influencing the transfer of surplus labor.

（ⅱ）Focusing on the factors concerning the rural households and individual farmers to find out the factors influencing the rational transfer.

Some factors play the role in promoting transfer，so when formulating relevant policies，it is necessary to give priority to these factors. For example，the study results show that age plays a significant role in the transfer of surplus labor，so we should strengthen young people's opportunities of working outside the home.

（ⅲ）Shifting the employment concept of surplus labor in rural areas.

We should lay stress on the transfer of labor forces，step up publicity efforts to redress farmers' misconceptions of labor transfer，transform the outmoded small farmer consciousness，learn to adapt to market economy to seek our own way of development. In addition to agriculture，there are many ways to survive.

（ⅳ）Speeding up the construction of small towns and developing the secondary and tertiary industries.

The construction of small cities and towns has obvious advantages in absorbing surplus labor in rural areas. For the poverty-stricken areas，the development of small cities and towns plays significant role in promoting non-farm employment. In the context of the construction of small towns，a number of township enterprises are bound to burgeon，which will absorb some surplus labor forces in rural areas to work in the township enterprises. The construction of small cities and towns can ease people's concept of employment outside the home. They can be engaged in non-farm employment in the township，do not have to work outside the home. Thus，they will not lose land as a guarantee. " Diversified employment" will be a long-term trend in the process of surplus labor transfer.

References

［1］LI RF. Rural labor force transfer：situation and countermeasures ［M］. Beijing：China Agriculture Press，2006：1 – 4. （in Chinese）.

［2］FU T. Discussion on current agriculture surplus labor force transfer in China［J］. Agricultural Bank of China Journal of ABC Wuhan Training College，2008（1）：59 – 60. （in Chinese）.

［3］ZHU QY，HOU ZR. The manpower capital investment and surplus labor forces transfer of the underdevelopment minority region and the theory of expiation mechanism of labor force transfer［J］. Inquiry Into Economic Issues，2004（8）：29 – 32. （in Chinese）.

［4］CAI RS，ZHAO YP，JIN CH. Present situation and countermeasures of training in the transfer of labor force from China' s impoverished areas［J］. Journal of Beijing Technology and Business University：Social Science Edition，2005（6）：1 – 7. （in Chinese）.

［5］CAI RS，ZHAO YP，WU KL. Research on the transfer of surplus labor force from China's poor areas［J］. Journal of Beijing Technology and Business University：Social Science Edition，2005（1）：50 – 54. （in Chinese）.

○∘○∘◆∘○∘

References

［1］GAO XJ. Land consolidation theory and practice［M］. Beijing：Geological Publishing House，2003. （in Chinese）.

［2］CHEN W，CHEN QY. A demonstration research on analysis evaluation of land consolidation benefit［J］. Scientific and Technological Management of Land and Resources，2007（4）：9 – 11. （in Chinese）.

［3］WU HJ，YANG S. Analysis on the pattern of rural land arrangement of the sustainable development in developed region—exampled in Danyang City of Jiangsu Province［J］. Journal of Nanjing Normal University：Natural Science Edition，2004，27（1）：106. （in Chinese）.

［4］JIANG YJ. On rural land consolidation in China［D］. Beijing：Peking University，2001. （in Chinese）.

［5］SHI YS. Review on the urban-rural integration［J］. Urban Planning Forum，2003（1）：18 –21. （in Chinese）.

［6］DONG LM，ZHANG M，WU LZ. Study on evaluation system to sustainable development in land consolidation［J］. Hubei Agricultural Sciences，2006（1）：23 –25. （in Chinese）.

［7］LIU WX. China town development and land use［M］. Beijing：The Commercial Press，2003. （in Chinese）.

［8］YAN JM，ZHONG JF，CHI GR. Land consolidation［M］. Beijing：Economic Management Press，1998. （in Chinese）.

［9］ZHONG ZM. Causes and control measures for rural free residential land［J］. Agricultural Economy，2008（6）：21 –22. （in Chinese）.

［10］LIU J，ZHOU X，JIANG Y. Land consolidation model implemented by linked rural households［J］. Journal of Anhui Agricultural Sciences，2011，39（30）：18790 –18792. （in Chinese）.

［11］ZHU XB，YANG LY. Combination points of rural land consolidation with new socialist countryside construction and corresponding countermeasures ［J］. Journal of Anhui Agricultural Sciences，2011，39（29）：18224 –18225，18264. （in Chinese）.