

## Behavioral Decision of Employment for Rural Labors: Evidence from Peasant Households in Central China

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### Abstract

*Based on the facts of the peasant household and its labors, this paper analyses rational behavior strategy of the peasants and studies the microeconomic impact factors on the peasant behavior of employment with a discrete choice model. According to Econometric analysis, conclusions has been derived as follows: Firstly, the peasants behavior of employment is consistent with their wills to raise their income; Secondly, the peasants allocate labor resource in their peasant household on comparative advantages; Thirdly, non-agricultural job opportunity is a vital channel to release recessive unemployment and achieve sufficient employment of rural labors; Finally, peasants in different areas show slightly different tendency on obtaining non-agricultural jobs.*

**Keywords:** rural labors; impact factors; employment choice

### Introduction

Many researches on decision making of peasant households have been carried out in the last decade, which mainly told us that their livelihoods and livelihood strategies are in the complexity of their whole household strategies (Ellis, 1993; Carney, 1998). Different hypotheses lead to different models, some are unitary models and others are collective ones. The former implies that members in one peasant household have a wholly consistent utility function which is defined by some internal and external characteristics of the household (See Barnum & Squire, 1979; Schultz, 1990; Thomas, 1990). The latter testifies that members of one household have different utility model of their own (See Chiappori, 1988; Browning and Chiappori, 1998; Foster and Rosenzweig, 2002). With the increase of literatures on this subject, more and more collective models have been testified, and the unitary model seemed to be neglected. We have formulated empirical model here for peasant households in central China and the empirical conclusions have been drawn that the strategy of the peasant household shows rationalism as a whole household. Economic resources of a peasant household have been allocated effi-

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ciently in it. We summarize the data of peasant household behaviors and ultimately find that the behavioral decision of employment lies in the internal and external characteristics of the household. Thus, we concentrate the employment strategy of members on a whole consideration of the household.

According to the study on a sample of 3,300 households in rural areas of Central China, four collections of households are classified on employment types, that is “pure agriculture household”, “agriculture with non-agriculture household”, “non-agriculture with agriculture household” and “pure non-agriculture household”<sup>1</sup>. The respective proportion of the four household types in the year 2002 and 2003 are shown in Table 1.

**Table 1.** The Respective Proportion of the Four Household Types in Central China (%)

	Pure agriculture household	Agriculture with non-agriculture household	non-agriculture with agriculture household	pure non-agriculture household
2002	14.91	57.30	26.45	1.33
2003	23.01	53.73	22.18	1.08

The basic features of each household type are demonstrated in Table 2. The table shows that the age structure differs between each type: the average age of non-agriculture household labors is the youngest and about 4.6 years younger than that of pure agriculture household labors, which indicates that the youth dominants in non-agri-

**Table 2.** Basic Indexes of the Households in the Sample (2003)

	Sample Capacity	Net Income per people (¥)	Arable Land per Person (Acre)	Ages per Person (Year)	Levels of Education per person (Year)	Ratio of Fostered accounts the Total Population (%)
pure agriculture household	749	2573.79	2.01	35.62	5.61	27.48
agriculture with non-agriculture household	1794	2372.12	1.43	33.41	5.73	26.99
non-agriculture with agriculture household	722	2967.31	0.91	31.89	5.79	29.34
pure non-agriculture household	35	4131.18	0.33	31.07	5.70	30.05

Source: survey on 3300 peasant households in rural areas of Central China in year 2003.

<sup>1</sup> We have classified the rural households in rural China into four groups, and the standard for the classification is origin of income sources, that is from farm work or non-farm work.

culture industries. From the perspective of cultivated resource, the tendency of working in non-agriculture industries shows strongly negative relationship with per capita cultivated farmland. With the decrease of per capita cultivated farmland, the tendency of participating in non-agricultural works increases correspondently, which displays that peasants' decision on works is obviously resource-directed. In the light of the data, the major income source of agriculture household is still from agriculture. Especially, a phenomenon is confirmed that the proportion of "non-agriculture with agriculture household" and "pure non-agriculture household" reduce steadily in recent years, which is contradictory to our expected tendency of increase of non-agriculture industries in the course of countryside development. Therefore, our research shall further explore the relationship between the decision of working and the raising of peasants' income.

Working in which agricultural field largely depends on the family i.e. the rational behavior of the peasants. Gary S. Becker (1976) argues that, as an enterprise, a family is an organization for members to decide a chain of distribution. They make decisions on the comparison of market price, production cost, return, and productivity. Moreover, on the strategy of resources distribution of family labors, it is the family, not the individual, as the basic unit, that decides the working field and makes the agricultural production, consumption and labor supply strategy into a unified family model. Peasants follow the relative advantage principle in their decision of working field, which indicates peasant is "Economic Person" who pursuits return of maximum amount. Therefore, the economic environment should be paid adequate attention. Although some economic behaviors look like "conservative" or "irrational", they are often the rational response restrained by given conditions. Working on the data from a survey on peasants in 10 villages of China, Shi et al (2004) concludes that peasants are completely economic rationalized in distribution of human resources in their own family. In research of non-agricultural labors in rural areas, Bai (2003) also found that the peasants' decisions on whether to leave their farms are rational strategy under the inside and outside conditions. In light of this, peasants' employment behavior is a rational behavior.

In economics, corresponding with the employment behavior, income is a stream, which consists of the income flow of a certain quantity per time. In the system which family operation dominates, the source of the income flow should be paid attention when we analyze increase in income. Modern approach explores that the source of income flow is valuable. Hence, each unit of income flow deserves a price. Therefore, the quality, quantity and the decision factors of peasants' income flow have become the original issues when study the peasants' income and employment.

From above, if we put peasants' employment and income into integrated consideration, the income depends on the source of income flow. Therefore, under the condition that rational behavior relates to labors' comparative advantage, the analysis of the peasants' income mainly concentrates on that of decisions on their works.

### Analysis of the micro-factors on peasants' income

The data in this part derives from the survey on a sample of 3,300 peasant households in Central China of the year 2003.

Establish following Multivariate Linear Regression:

$$INCOME = \beta_0 + \beta_1 ALT + \beta_2 ULT + \beta_3 MCV + \beta_4 (PFV + FCV) + \beta_5 S + \beta_6 LAB + \beta_7 EDU + \beta_8 PRT + \beta_9 TAXT + \beta_{10} RICE + \beta_{11} DIS + u$$

Table3 gives description to the variables.

**Table 3.** Description of Model Variables

<i>Variable</i>	<i>Description</i>
<i>Dependent variables</i>	
INCOME	Net income from all sources (¥)
ALT	Labor time allocated to farm work (Hour)
ULT	Labor time allocated to off-farm work (Hour)
<i>Characteristics of human resources</i>	
LAB	Number of adults in the household
EDU	Number of years of schooling of average individual member (Year)
<i>Household's characteristics</i>	
S	The area of household farm (Acre)
MCV	Investments of household farm (¥)
PFV	Value of productive fix asset of household farm (¥)
FCV	Value of portfolio of household (¥)
PRT	Burden rate of fostering(number of fostering members which is divided by the total number of members)
TAXT	Taxation Rate of household
RICE	Areas of cultivated land (Acre)
DIS	Average distance to the nearest urban centre of commercial farm (Km)

The estimates of Table 4 indicate that working in non-agriculture fields can dramatically improve household income; the increase of unit hour work on non-agriculture fields will result in 5.2% increase of household income. In fact, showed by the survey, the proportions of “agriculture with non-agriculture household” and “non-agriculture with agriculture household” have declined while that of “pure agriculture household” has risen recently. There probably doesn't exist a tendency toward employment in non-agriculture fields. The cause of this probability lies in two aspects. On the one hand, in the process of promoting agriculture industrialization, the government attaches great importance to the development of specialized household, so the proportion of “pure agriculture household” rises to some extent. On the other hand, peasants are restricted by interior and exterior factors when shift and get employment in non-agriculture industries.

Under special conditions, agricultural households' behaviors are to obtain some non-agricultural jobs to raise their incomes on the basis of accomplishing their agricultural production. Consequently, the impact factors of the peasants' employment behavior become the core issue for us to do some research.

**Table 4.** Multivariate Linear Regression Model Estimates

<i>Independents</i>	<i>Coefficients(t)</i>	<i>Standardized Coefficients</i>	<i>Sig.</i>
Constant	3699.608(5.524)		.000
ALT	-4.730**(-2.706)	-0.057	.007
ULT	2.702*(2.423)	0.052	.015
MCV	1.559**(53.764)	0.612	.000
PFV+FCV	0.215**(21.406)	0.244	.000
S	3.095**(14.527)	0.166	.000
LAB	995.605**(4.455)	0.116	.000
EDU	194.311**(3.633)	0.040	.000
PRT	2019.950*(3.827)	0.051	.000
TAXT	-14593.4*(-10.807)	-0.118	.000
RICE	-763.354(-1.825)	-0.020	.068
DIS	-23.767*(-6.035)	-0.066	.000

\* Statistically significant at 5% level.

\*\* Statistically significant at 1% level.

### Analysis of the micro-factors, which affect peasants' employment decision

#### Model and Variables

Let us suppose an agricultural household has several choices under a given restriction. The choices muster is {works on farm solely  $J_0$ , works on farm with other works  $J_1$ , mainly works on non-agriculture  $J_2$ , almost completely works on non-agriculture  $J_3$ }, and for  $i$  household, it can gain utility of  $U_{ij}$ , which is known to the  $i$  household. So the  $i$  household's probability of choosing the  $j$  can be shown by the equation (1):(the  $U_{ij}$  is replaced by  $V_{ij}$ , just because  $U_{ij}$  can not be observed directly while  $V_{ij}$  can)

$$\begin{aligned}
 P_{ij} &= p(U_{ij} > U_{ik}, \forall k \neq j) = p(V_{ij} + e_{ij} > V_{ik} + e_{ik}, \forall k \neq j) = \\
 &= p(e_{ik} - e_{ij} < V_{ij} - V_{ik}, \forall k \neq j)
 \end{aligned}
 \tag{1}$$

According to the impact factors of agricultural households' employment behavior, the following concrete model is equation (2):

$$V_{ij} = \beta_{1j} + \beta_{2j}OLD + \beta_{3j}EDU + \beta_{4j}PRT + \beta_{5j}S + \beta_{6j}DIS + \beta_{7j}EINC + \beta_{8j}UPLAND + \beta_{9j}MOUNT \quad j = J_0, J_1, J_2, J_3 \quad (2)$$

and we can gain the result showed by equation (3): (See the specification of Appendix)

$j = J_0, J_1, J_2$ , and then

$$P_{ij} = \frac{\exp(V_{ij})}{\sum_{k=1}^J \exp(V_{ik})} = \frac{\exp(\beta_{1j}^* + \beta_{2j}^*OLD + \beta_{3j}^*EDU + \beta_{4j}^*PRT + \beta_{5j}^*S + \beta_{6j}^*DIS + \beta_{7j}^*EINC + \beta_{8j}^*UPLAND + \beta_{9j}^*MOUNT)}{1 + \sum_{k=J_0}^{J_3} \exp(\beta_{1k}^* + \beta_{2k}^*OLD + \beta_{3k}^*EDU + \beta_{4k}^*PRT + \beta_{5k}^*S + \beta_{6k}^*DIS + \beta_{7k}^*EINC + \beta_{8k}^*UPLAND + \beta_{9k}^*MOUNT)} \quad (3)$$

Several variables are selected to explain the dependent variable, that is: average age of labors of agricultural household (OLD), birthrate (PRT), cultivated land (S), Average distance to the nearest urban centre from commercial farm (DIS), the expected net income from agriculture (EINC), upland districts (UPLAND), mountain districts (MOUNT).

### **Econometric results**

The results of Table 5 show some points as follows:

(1) When the agricultural households make employment choice, peasants especially pay attention to the increase of their incomes. EINC indicates the peasants' expectation of the incomes in current year. Labors in rural areas will adequately assess the coming incomes and their sources during the course of choice. Besides, it is found that EINC has a negative impact on non-agriculture employment behavior. EINC's impact on the behavior strengthens with the increasing tendency of non-agriculture employment. EINC's standardized estimate decreases from 3.054 to 0.103, and then to -1.803. It shows that income source is the highest concerned part in the employment behavior, which is corresponding with the theory we mentioned before.

(2) Human capital situation has a great impact on the employment behavior, among which, OLD dominates. A peasant's labor capital situation is reflected by OLD, EDU and PRT in this thesis. Peasant households would make decisions according to their own situation when labor resources. The estimates show that the age of labor has greater impact on the employment decision than educational level. Observe from Exp(B) of Variable OCD, the unit increase in the age of labor would result in 1.2% decrease in non-agricultural employment. This proves that old age turns against the non-agricultural employment among rural labor. Compared to the youth, the elder labors, as bet-

**Table 5.** Estimates of Agricultural Households' Employment Decision

Variable	$J_0$			$J_1$			$J_2$		
	B	Standardized Coefficients	Sig.	B	Standardized Coefficients	Sig.	B	Standardized Coefficients	Sig.
Intercept	-17.78**		.000	-0.040		.916	4.190**		.000
OLD	0.041**	0.202	.000	-0.012*	-0.059	.008	-0.012	-0.059	.181
EDU	-0.016	-0.017	.778	-0.022	-0.023	.465	0.038	0.040	.502
PRT	0.732	0.083	.221	-0.783**	-0.089	.010	0.728	0.083	.198
S	0.005	0.014	.696	0.008	0.022	.277	-0.030	-0.082	.141
DIS	-0.034	-0.018	.671	0.063	0.033	.094	-0.075	-0.040	.248
EINC	18.390**	3.054	.000	0.623**	0.103	.000	-10.860**	-1.803	.000
UPLAND	-0.252	-0.067	.101	0.262**	0.069	.002	0.496**	0.131	.002
MOUNT	-0.358	-0.087	.056	0.635	0.154	.000	-0.038	-0.009	.821
Nagelkerke R Square	0.731			0.350			0.662		
-2LL	1372.318			3462.088			1608.266		
Number	3300			3300			3300		

\* Statistically significant at 5% level.

\*\* Statistically significant at 1% level.

ter-experienced, have much greater comparative advantages in farming; while the younger labors, master more knowledge and adaptive capacities. Therefore, youths get more opportunities to participate in non-agricultural activities. However, it is unexpected that EDU doesn't show obvious statistically significant. Two reasons account for this outcome. Firstly, when rural education, especially the rural basic education does not correspond to actual non-agricultural employment demand the education still transfer basic knowledge to candidates. Meanwhile, because of lagged development of rural vocational education, rural labors are so lack of professional education and job training that they don't have advantages in non-farm employment. Secondly, instead of regard self-educational level as an essential factor of employment decisions, peasants prefer to make choices under certain system restrictions of non-agricultural employment.

(3) To household natural resources, the larger the quantity of arable land is, the less probability they would choose non-agricultural employment. Nevertheless, the former has no significant influence on the latter. On the other hand, the distance between the peasant households and the center of commercial farm, has little impact on employment choice making. Household arable resource is one of the prerequisites for rational distribution of labor, which is implemented by the members of peasant households between agricultural and non-agricultural industries. The reasons for distribution of labor are twofold. First, due to various hours of work, the peasants may make different decisions. Secondly, the comparative advantage of labor has some effect on the distribution. Neither S nor DIS has a significant impact on the household employment decisions. This indicates that agricultural industries of arable land and employment of non-agriculture

both don't depend on the natural resources, which belong to the peasant households. Meanwhile, agricultural industries and non-agricultural employment turn to be alternative in time allocation. Therefore, in the issue of allocation of labor resources employment, peasant households may be inclined to make distribution of labors according to their comparative advantages.

(4) Different regions of peasants show considerable discrepancy in employment behaviors. The comparative basis for hill country is plain country, peasants in hilly country have stronger tendency to non-agricultural employment than that in plain country. On both decisions of "agriculture with non-agriculture" and "non-agriculture with agriculture", UPLAND variable has a remarkable and positive influence. Relative to the hilly country, peasants in the mountain area hold a more cautious attitude towards non-agricultural employment. Reflected by MOUNT variable, there is an inner driving force for peasants to participate in non-agricultural activities, especially off-farm work, so they prefer agriculture with non-agriculture employment to pure agriculture work. The negative regression coefficient presented above confirms that even though peasants have strong wills to participate in non-agricultural activities, they are not determined to work nonfarm. Instead, peasant households intent to take the arable land as a special "minimum insurance", as well as concern the larger risk they would take under the non-agricultural employment other than expected income.

As indicated above, during the process of allocation of labor resources, peasant households would seek their own benefits when adequately consider personal characteristics and prior external conditions, and the benefits actually incarnate the expectation of raising income. As noted earlier, the main way to raise peasants' income is to participate in non-agricultural employment according to abilities of each household. However, engage in non-agricultural work means not only work in local rural enterprises or other scattered service industries, but also work off-farm, which dominates in the larger and larger scale of non-agricultural employment. Thus, our further research will pay particular attention to the peasant households, which have labors working off-farm and do research on their employment behaviors.

## **Analysis of the Micro-factors of Labors Doing Off-farm Work**

### ***Model and Independent Variables***

This part attempts to do some research on off-farm labor decisions of employment. The most essential step is to analyze the influence factors on the tendency of peasants' off-farm working. Let us take the proportion of off-farm working hours in whole working time to represent the tendency of peasants' off-farm working.

The multi-monolog model demonstrates as follows:

$$\begin{aligned} \ln \text{RATIO} = & \beta_0 + \beta_1 \text{DIF} + \beta_2 \text{S}^2 + \beta_3 \text{PFV} + \beta_4 \text{PRT} + \beta_5 \text{EVOLD} + \beta_6 \text{EVEDU} \\ & + \beta_7 \text{UPLAND} + \beta_8 \text{MOUNT} + \beta_9 \text{GOV} + \beta_{10} \text{REL} + \beta_{11} \text{SELF} + u \end{aligned}$$



Here, we adopt following variables. DIF represents the income gap between agricultural and non-agricultural industries last year; the rest are household arable land (S), vacancies of productive fixed assets (PFV), ratio of household upbringing (PRT), the average length of education of labors off-farm (EVEDU), and other dummy variables, such as hilly country (UPLAND), mountain area (MOUNT), working off-farm organized by governments or enterprises (GOV), working off-farm introduced by relatives (REL), and working off-farm by self-decision (SELF). Besides,  $u$  is random disturbance term.

### *Results of Econometric Analysis*

The regression results indicate the following Table 6:

**Table 6.** The multi-monolog model of off-farm work decision

Model	Coefficients	Standardized Coefficients	t	Sig.
Constant	0.101		8.267	.000
DIF	5.735E-07*	0.028	2.205	.028
S <sup>2</sup>	-1.89E-05	-0.020	-1.596	.111
PFV	-8.02E-07*	-0.025	-1.994	.046
PRT	-0.266**	-0.377	-6.024	.000
EVOLD	3.649E-03**	0.213	5.084	.000
EVEDU	-1.07E-03	-0.014	-1.132	.258
UPLAND	-5.65E-05	0.001	-0.014	.989
MOUNT	1.166E-02**	0.038	2.579	.010
GOV	0.150**	0.245	8.659	.000
REL	0.148**	0.899	5.223	.000
SELF	0.146**	0.909	5.857	.000

Source: survey on 3300 peasant households in rural areas of Central China in year 2003.

\* Statistically significant at 5% level.

\*\* Statistically significant at 1% level.

The probability of labors working off-farm highly depends on peasants' expectation of the income gap between agricultural and non-agricultural activities. Compared to the income from agricultural activities, peasants find that more income can be earned in off-farm work. This view has become a potential motive for off-farm labor decisions. The peasant households' behaviors are based on the rational comparison of incomes between off-farm and local activities. The greater the expected income gap exists between agricultural and non-agricultural employment, the larger probability of pursuing off-farm employment is. The marginal ratio of possibility is 2.8% (unit income is ¥). Generally, peasants who work nonfarm are mostly engaged in non-agricultural activities. At the same time, peasants pay close attention to their move cost during the decision-making process. In fact, the comprehensive evaluation on net income of nonfarm

work supports this viewpoint as well.

Relaxing economic pressure is another crucial factor which make peasant to engage in off-farm work. As noted earlier, rural labors will make consideration on the whole interests carefully, in the decision-making of off-farm work. The regression further indicated that undertaking off-farm work is essentially a process of redistribution and optimization of household human resources.

Peasants in mountain areas are more likely to participate in off-farm work. As presented above, the standardized coefficient of MOUNT variable is 3.7% higher than UPLAND variable, which shows that off-farm work is more attractive to peasants in hilly country. We observe that the will for those peasants to take such work lies in two aspects. On the one hand, income from township enterprises is so higher than village enterprises that peasants are much likely to undertake off-farm work. Mountain areas, where transportation is inconvenient, have extraordinary disparities in both two sides i.e. the gap of incomes as well as infrastructure construction between village and township enterprises. Therefore, in order to earn higher income, and acquire better opportunity of self-development, peasants, especially the youths, tend to participate in off-farm employment, which has become an important way for household work. On the other hand, the changes of the interior comparative economic status stimulate labors to do off-farm work. Income gap enlarges recent years inside rural areas, of which the speed is even higher than that between villages and township regions. Specifically, the Gini coefficient of the rural areas in Central China has increased 3.7% from 0.27 in year 2000 to 0.28 in 2003. As we have already seen, it is not surprising that peasants hold stronger motive to work off-farm since they are sensitive to the inferiority of economic status. This finding is consistent with results from another research on labors working off-farm in poor areas by Cai,F.(1998), i.e. the changes of peasants' comparative economic status, becomes an essential motivation for off-farm labor decisions.

Labors' off-farm tendency can be affected by organized ways to various extents. Estimates show that among all channels, the most efficient one is spontaneous way. The second one is introduced by relatives and the final one with the least effect is organized by governments or local enterprises. This analysis confirms that the information services for peasants working off-farm are not multiple and labor market information is usually collected by themselves or from friends or relatives. Therefore, the government should do much more in promoting off-farm employment. It is believed that government can better facilitate a rational flow of rural labors.

### **Conclusions and Policy Implications**

According to the analysis above, conclusions could be made as follows:

Firstly, peasants' employment behavior is consistent with their wills to raise their incomes. In the decision-making process, peasants will set the maximum income as their goals, as well as choosing the work which can bring themselves and families the highest income, by considering the well-known self-condition and the restriction of systems.

Secondly, peasant households comply comparative advantages when carry out the allocation of labor resources. Those labors within non-agricultural employment are always to be found young and good at non-farm work. Members in households with old age are likely to engage in the agricultural work. Limited arable resource is another cause for peasants to take non-agricultural jobs. Meanwhile, in the allocation of household labor resources, peasants consider working seasons. Members of households who involves in non-agricultural work are likely to participate in home-farm work during busy seasons, but in slack farming seasons, they spend more time on off-farm work or other part-time jobs.

Thirdly, off-farm work is a vital channel to release recessive unemployment, and promote sufficient employment. Nowadays, in most situations, taking off-farm work is a spontaneous decision. Adequate opportunities of employment can be offered by non-social groups, such as relatives, friends and people from neighbor-towns. However, the government's endeavor of facilitating a rational flow of rural labors is found not enough. Meanwhile, with industrializing and internal structural adjusting of agriculture, some important fields which are recruiting more labors into work would develop gradually. We should attach great importance to these fields.

Finally, peasants in different areas show slightly different tendency towards non-agricultural employment. Rural labors in rolling country prefer to work off-farm, contrary to plain country. Although the peasants in mountain areas have stronger intent to work off-farm, they hold cautious view in realistic decisions. As a whole, peasants from different regions will make all-sided consideration on employment interests and costs in the process of off-farm decision-making.

According to the analysis of the peasants' employment behavior and the influencing factors, the author suggests that government should adopt measures as follows:

Firstly, to promote employment of rural labor forces, government policy should not only concentrate on arable land, agriculture or rural areas, but also to balance urban and rural development. This entails policies which can help to establish gradually a unified and highly efficient labor market of both urban and rural areas, as well as promote agricultural labor transfer. It is the rational measure of efficiently and rationally transferring peasants to non-agricultural industries that can solve the problem of employment of the labor forces.

Secondly, the basic reason for agricultural labor transfer is the excessive agricultural resources of Central China, especially its arable resources can not support such large quantity of labors. Hence, the government policy of diversification should be implemented. However, we can not ignore the research on the ability of absorbing labor of the primary industry which includes developing labor-intensive industries and special agriculture with higher added value, such as vegetables and flowers. Especially, since the rural areas of Central China are abound in water resources, this would entail an approach in developing water industries, which can absorb certain quantity of labors transferred from arable land. Moreover, processing industries for farm products should become the core field of the rural industries. Further evidence from both domestic and

international researches shows that processing industries for farm products and the supporting services such as storage, transportation and sale are important channels, which improve the employment for rural labors.

Thirdly, government policy of peasants' employment should be consistent with local conditions. In light of different industrial structures in different regions, varying strategies of industrial development should be adopted. According to different tendencies for peasant to work off-farm in mountain area, hilly country and plain country, we suggest different turnover policies of land, with various extents. In mountain area, flexible policies would be adopted to deal with turnover land and responsibility system. Although both the plain country and hilly country have limited arable land, a policy for long-term off-farm labor to exchange land for "insurance" could be implemented step by step. On one hand, this way not only guarantees that peasants transferred to cities can enjoy corresponding urban social insurance, but also decreases the risk prediction of off-farm work. On the other hand, the rational utilization of the land resources for agriculture can be realized. Furthermore, as agricultural activities could fully utilize the rural labors, the efficiency of rural labor employment will be raised.

Finally, currently, since the systematization of working off-farm doesn't show a significant level, the government still has lots of work to do in organizing the peasants transfer to non-agricultural employment. On the basis of the exact understanding of value orientation of local peasants, governments should try to collect the employment information and provide them to the peasants promptly when organize peasants to work off-farm. In fact, government should offer more job training opportunities and improve rural basic education, in light of realistic situation of the peasants.

## APPENDIX

Define choice collections of peasant households in allocation of employment for {pure agriculture household  $J_0$ , agriculture with non-agriculture household  $J_1$ , non-agriculture with agriculture household  $J_2$  and pure non-agriculture household  $J_3$ }. To the Family  $i$  of Choice  $J$ , Assume that the utility of Choice  $j$  is  $U_{ij}$  which is known by Family  $i$  (Family  $i$  doesn't know the detailed form of the benefit, but there are determined values in their minds). Since peasant households are sensible, peasant household will choose the one of greatest utility in the choice collections. Family choose  $j$  only when  $U_{ij} > U_{ik}$ ,  $\forall k \neq j, k \in J$ . We have observed some features of Peasant Household  $i$  adopting Choice  $j$  i.e.  $x_{ij}$  and family feature  $s_i$  of this peasant hold. The probability of Peasant  $i$  adopting Choice  $j$  is  $V_{ij} = V(x_{ij}, s_i)$  which is created according to the features referred before and some estimated parameters are necessary in  $V_{ij}$ . However, since  $U_{ij}$  can't be observed directly, the item we have observed are origins for all kinds of income flows of the peasant households. Hence  $U_{ij}$  shouldn't be substituted directly by  $V_{ij}$ . Here we decompose  $U_{ij}$  as  $U_{ij} = V_{ij} + e_{ij}$ ,  $e_{ij}$  includes the factors which belongs to  $U_{ij}$  but not  $V_{ij}$ , here  $e_{ij}$  also can't be observed. We regard  $e_{ij}$  as random variable. Hence, the probability of Fam-

ily  $i$  adopting Choice  $j$  can be exhibited as :

$$\begin{aligned} P_{ij} &= p(U_{ij} > U_{ik}, \forall k \neq j) = p(V_{ij} + e_{ij} > V_{ik} + e_{ik}, \forall k \neq j) = \\ &= p(e_{ik} - e_{ij} < V_{ij} - V_{ik}, \forall k \neq j) \end{aligned} \quad (1)$$

Assume that random vector  $e_i = (e_{i1}, e_{i2}, \dots, e_{ij})$ 's joint density function is  $f(e_i)$ , define eigenfunction for :

$$S(e_{ik} - e_{ij} < V_{ij} - V_{ik}, \forall k \neq j) = \begin{cases} 1 & e_{ik} - e_{ij} < V_{ij} - V_{ik}, \forall k \neq j \\ 0 & \text{otherwise} \end{cases} \quad (2)$$

so the probability of Peasant  $i$  adopting Choice  $j$  can be expressed as the expected value of the eigenfunction  $E(S)$ , i.e. :

$$P_{ij} = E(S) = \int_e S(e_{ik} - e_{ij} < V_{ij} - V_{ik}, \forall k \neq j) \cdot f(e_i) de_i \quad (3)$$

Equation (3) is multiple integral of the joint density function  $f(e_i)$  on the portion which can't be observed in the utility function. Here we assume  $e_i$ 's distribution is consist with logit model , we can imitate employment behavior of the peasant households.

Aim at microeconomic factors, which affect employment choices of the agricultural labors, the author establishes a further detailed model as follows:

$$\begin{aligned} V_{ij} &= \beta_{1j} + \beta_{2j}OLD + \beta_{3j}EDU + \beta_{4j}PRT + \beta_{5j}S + \beta_{6j}DIS + \beta_{7j}EINC \\ &+ \beta_{8j}UPLAND + \beta_{9j}MOUNT \quad j = J_0, J_1, J_2, J_3 \end{aligned} \quad (4)$$

We can get Equation (5) from Equation (4):

$$\begin{aligned} U_{ij} &= \beta_{1j} + \beta_{2j}OLD + \beta_{3j}EDU + \beta_{4j}PRT + \beta_{5j}S + \beta_{6j}DIS + \beta_{7j}EINC \\ &+ \beta_{8j}UPLAND + \beta_{9j}MOUNT + e_{ij} \quad j = J_0, J_1, J_2, J_3 \end{aligned} \quad (5)$$

Put Equation (4) into Equation (3), with McFaden (1973)'s prove ,under the condition which assumes that  $e_{ij}$  shows first type extreme-value distribution to all the  $j$ s (independently same extreme-value distribution), the probability of Peasant  $i$  adopting Choice  $j$  is:

$$P_{ij} = \frac{\exp(V_{ij})}{\sum_{k=1}^J \exp(V_{ik})}$$

$$\frac{\exp(\beta_{1j} + \beta_{2j}OLD + \beta_{3j}EDU + \beta_{4j}PRT + \beta_{5j}S + \beta_{6j}DIS + \beta_{7j}EINC + \beta_{8j}UPLAND + \beta_{9j}MOUNT)}{\sum_{k=J_0}^{J_2} \exp(\beta_{1k} + \beta_{2k}OLD + \beta_{3k}EDU + \beta_{4k}PRT + \beta_{5k}S + \beta_{6k}DIS + \beta_{7k}EINC + \beta_{8k}UPLAND + \beta_{9k}MOUNT)} \quad (6)$$

To estimate parameters in Equation (6), here we regard  $j = J_3$  as the basis for comparison, i.e. let  $\beta_{ij}^* = \beta_{ij} - \beta_{iJ_3}$ ,  $j = J_0, J_1, J_2$ .

So Equation (6) becomes : for  $j = J_0, J_1, J_2$ ,

$$P_{ij} = \frac{\exp(V_{ij})}{\sum_{k=1}^J \exp(V_{ik})} =$$

$$\frac{\exp(\beta_{1j}^* + \beta_{2j}^*OLD + \beta_{3j}^*EDU + \beta_{4j}^*PRT + \beta_{5j}^*S + \beta_{6j}^*DIS + \beta_{7j}^*EINC + \beta_{8j}^*UPLAND + \beta_{9j}^*MOUNT)}{1 + \sum_{k=J_0}^{J_2} \exp(\beta_{1k}^* + \beta_{2k}^*OLD + \beta_{3k}^*EDU + \beta_{4k}^*PRT + \beta_{5k}^*S + \beta_{6k}^*DIS + \beta_{7k}^*EINC + \beta_{8k}^*UPLAND + \beta_{9k}^*MOUNT)}$$

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