

**EPTD DISCUSSION PAPER NO. 74**

**DOES *GUANXI* MATTER TO NONFARM EMPLOYMENT?**

**Xiaobo Zhang and Guo Li**

**Environment and Production Technology Division**

**International Food Policy Research Institute**

**2033 K Street, N.W.**

**Washington, D.C. 20006 U.S.A.**

**June 2001**

*EPTD Discussion Papers contain preliminary material and research results, and are circulated prior to a full peer review in order to stimulate discussion and critical comment. It is expected that most Discussion Papers will eventually be published in some other form, and that their content may also be revised.*

## ABSTRACT

Because land is scarce, farmers in China increasingly have to rely on nonfarm activities to enhance their incomes. The functioning of rural nonfarm labor markets is therefore crucial in determining who has access to nonfarm employment. Previous studies have identified human capital as a key factor determining the selection of workers in the rural nonfarm economy. Using a detailed household survey of northern and northeastern China, this paper shows that *guanxi* (social networks), has also played an important role. With limited nonfarm job opportunities and poor market information, farmers with better social contacts are more likely to obtain nonfarm jobs. Moreover, *guanxi* has a larger effect on the nonfarm employment opportunities of male workers than female workers.

KEYWORDS: Farming, China, nonfarm, *guanxi*

## TABLE OF CONTENTS

1. Introduction.....	1
2. Background .....	3
3. Data .....	5
4. Model and Estimation.....	10
5. Conclusions .....	20
References.....	23

## **ACKNOWLEDGMENTS**

The authors gratefully acknowledge helpful comments from Peter Hazell, Yaohui Zhao, Zhi Wang, and participants in a session of the Annual Allied Social Sciences meetings, New Orleans, January 4-8, 2001. The views expressed in this paper are those of authors and should not be attributed to the World Bank or to affiliated organizations. The data used in the paper was collected through a collaborative effort between Research Center of Rural Economy (China), University of Toronto, and Stanford University. The World Bank, International Development Research Center of Canada, and the Stanford University's Graduate Research Opportunity Fund provided financial support for the data collectin.

*“Relying on families when at home, whereas counting on friends when away from home.”*

--- A Chinese Saying

## **DOES GUANXI MATTER TO NONFARM EMPLOYMENT?**

Xiaobo Zhang<sup>1</sup> and Guo Li<sup>2</sup>

### **1. INTRODUCTION**

With the success of the rural reforms starting in the late 1970s, a large number of agricultural labors have been released from agricultural production in China. With limited land available for farming, nonfarm employment has become one of the major ways for farmers to improve their incomes. As a result, employment in the nonfarm sector grew from 7 percent of total rural employment in 1978 to almost 30 percent in 1998 (SSB, 1999)<sup>3</sup>. And over the same period, rural enterprises increased their share of national GDP from virtually zero to 25% while the share of rural income arising from nonfarm activities increased from 8.5% to 39.3% (SSB, 1999). The expansion of the rural economy has become one of the most important features in Chinese economy (Rosegrant and Hazell, 2000).

Despite the rapid growth of the nonfarm sector, there are still insufficient nonfarm jobs in most regions, and workers are selected who have better physical and human capital. Accordingly, many scholars argue that demographic characteristics and human capital are the two most important factors in explaining observed patterns of nonfarm employment (Meng,

---

<sup>1</sup> International Food Policy Research Institute

<sup>2</sup> The World Bank

<sup>3</sup> These figures are from the official China Statistical Yearbook. Agricultural and non-agricultural employments are classified by major activities. For instance, a farmer primarily engaged in agricultural production and secondarily in commerce is classified as an agricultural laborer. Under this classification, the nonfarm employment is likely to be underestimated since most farmers are engaged in part-time nonfarm activities.

1990; Rozelle *et al.*, 1999; Yang, 1999; Zhao, 1999; Tuan, Somwaru, and Diao, 2000). The general finding from these studies is that young, well-educated, male farmers have a better chance of finding nonfarm jobs. An implicit assumption underlying these analyses is that all workers have access to the same set of information about the nonfarm labor market. But this ignores another important factor –*guanxi*. China has long been a *guanxi*-based society and there is a large body of sociology and anthropology literature concerning the use of *guanxi* to acquire power, status and resources in China.<sup>4</sup> In her seminal book, Yang (1994) extensively shows the importance of *guanxi* in daily life in China from an anthropological perspective. Her key observation is that the more connections a person has, the more opportunity he/she is likely to find. Lovett, Simmons, and Kali (1999) also points out the centrality of *guanxi* in China's business practices based on an international comparison. Li and Li (2000) argue strongly that in most business practice, China is a relation-based economy rather than a rule-based economy. Bian (1994) describes the importance of using *guanxi* in acquiring jobs in cities:

“Because of a lack of advertising and formal hiring procedures, *guanxi* became the predominant means of channeling individuals into work units. People used their *guanxi* to solicit employment information, to create application opportunities and to influence informal screening. In a sense, *guanxi* was the lifeblood of direct individual job application ....” (p. 979)

Rural residents rely more on kinship in supporting each other than urban residents, hence we should expect *guanxi* to be a more significant factor contributing to nonfarm employment in rural areas than in cities. In this paper, we empirically examine the critical

---

<sup>4</sup> The word *guanxi* (in Chinese) refers to the social networks of personal relationships. In this paper, the term of *guanxi* and social networks are used interchangeably.

role of social networks in rural nonfarm employment by incorporating it into a model of nonfarm employment. If *guanxi* is present and important in the labor market, then overlooking it will affect the estimated coefficients for schooling and other variables in the model, leading to biased estimates of the returns to investment in human capital. On the other hand, a significant and positive *guanxi* variable means that those who have access to it will have greater comparative advantage in securing nonfarm jobs than those who do not. If true, then government may need to adopt some pro-active measures to make market information more widely available to individuals lacking *guanxi*, especially those living in less-developed regions.

The paper is structured as follows. Section 2 discusses the development of nonfarm activities and the importance of social networks. Section 3 describes our data sources. Section 4 presents the model and estimations, and section 5 presents our conclusions.

## **2. BACKGROUND**

Although the nonfarm sector is now the major engine of growth for farm household incomes, its development is unevenly distributed and variations in nonfarm income play a critical role in explaining worsening regional income inequalities (Rozelle, 1994). These regional differences in nonfarm development can be illustrated by comparing Zhejiang and Liaoning provinces. In Zhejiang, a southern coastal province in China, the proportion of nonfarm employment was 57 percent in 1996, whereas in Liaoning Province of north China, the proportion was only 26 percent (SSB, 2000). Yet the rural labor forces in the two provinces share similar demographic characteristics, such as their gender ratio, age structure, and human capital. Moreover, the average years of schooling in Zhejiang and Liaoning

provinces was 6.6 and 7.3 years, respectively, in 1996. Although Liaoning has a higher education attainment, the proportion of its rural laborers engaged in nonfarm activities outside the province was only 0.5 percent, much lower than that in Zhejiang where more than six percent of rural labor force worked outside their own province.

The above comparison highlights the insufficiency of using only personal characteristics and human capital variables to explain the observed patterns of nonfarm employment. In this paper, we argue that *guanxi* networks, a missing aspect in standard economic analyses, are also important channels affecting nonfarm employment outcomes.

China's rural labor market has two important characteristics. First, there are very few public venues in providing farmers with information about job and business opportunities. From the information point of view, rural labor markets are very imperfect. Under these conditions, personal networks often play a key role in conveying valuable information and minimizing search costs (Montgomery, 1991) and therefore may become major channels for people to find nonfarm jobs and business opportunities. For example, it is widely observed that migratory workers in cities transmit information on job opportunities and technical know-how back to relatives and friends in their villages of origin. This kind of social network expands the horizon for workers seeking nonfarm job opportunities and helps mitigate the risks and uncertainties of taking jobs outside their local communities. Rozelle *et al.* (1999) observes that the likelihood that more people will migrate is extremely high if someone in the village has already out-migrated. These kinds of information networks help explain the overwhelming proportion of migrants from Zhejiang Province who work in the service sector all around China.

Second, there is a large surplus of rural workers in rural China and hence nonfarm employers are extremely selective. When jobs are scarce, social groups are likely to accommodate their own members first (Banerjee, 1983). Rural people generally have more tightly knit networks of family members than urban people. Many people from the same village are often related to each other through birth or marriage, often to the point where people from the same village are often loosely regarded as one “big family”. Wu (1994) observes an important rule prevalent in rural communities: “a family’s benefit should not be shared with people from other families unless it favors the family’s interest” (p. 121). Hence, if a village has a collective enterprise, it tends to hire its workers and key managers from local communities (Wu, 1994; Nee, 1996).

These two characteristics of the labor market suggest that personal ties to the outside world as well as the level of local nonfarm development will affect an individual’s chances of obtaining nonfarm employment. Since most farmers in China work at non-farm activities on a part-time basis and hence is not recorded in most official employment data (Tuan, Somwaru, and Diao, 2000), then we must use household survey data to test these hypotheses.

### **3. DATA**

#### **DATA**

The data set used in this paper came from the 1995 North and Northeast China Living Standards Survey (NNCLSS). The survey was carried out in the summer 1995, and covered 787 households in 6 counties, 18 townships and 30 villages in Hebei and Liaoning provinces (North and Northeast China)<sup>3</sup>. The survey provides detailed information about household characteristics (e.g. demographic structure, education, housing conditions, farm size) and

economic activities (e.g. farm management, own non-agricultural business, off-farm jobs, household expenditure, gifts, remittances, savings and loans). The survey design was based on the World Bank's Living Standards Measurement Survey that is described in more detail by Glewwe and Grosh (1998).

The six counties were not selected randomly, but were chosen to correspond to the site of an intensive household-level investigation carried out by Japanese investigators in 1936 and 1937. Five villages in each county were selected, one of which had been fully enumerated in the 1930s. The other four villages in each county were selected so as to obtain as representative a cross-section as possible. They included one village from the same township as the administrative capital; one located in the same township as the village surveyed in the 1930s; and two drawn from a third township. A total of 130 households were surveyed in each county: fifty from the village surveyed in the 1930s and twenty from each of the remaining four villages. Households were chosen randomly using the most recent village registry.

## DESCRIPTIVE STATISTICS

The average per capita income in the sample was 3510 RMB, or about US\$442. Farm income accounted for nearly half of total income. Nearly three-quarters of farm income came from cropping (mostly corn in Hebei, and rice and corn in Liaoning) and the rest came from such sidelines as vegetable gardens and greenhouses.

Nonfarm activities included family-run businesses and off-farm wage employment. Family-run businesses accounted for slightly more than twenty percent of total household income. Nearly a third of all households were involved in some type of nonfarm business, such as construction, transportation, commerce, and restaurants. Wage income accounted for

about 15% of total income, with three-quarters of that coming from male wage earnings. Slightly more than a third (36.2%) of these jobs were in the villages in which the respondent households lived; 43.1 percent were in either the county or township seat; and the remainder (20.7 percent) were in the cities. Most of these jobs were found by households on their own and were not “allocated” or “rationed”.

The Gini coefficient for household income in the entire sample is 0.4. Income from nonfarm sources is the most unevenly distributed hence this paper’s focus on investigating the driving forces behind the development of nonfarm activity. Table 1 reports basic descriptive statistics about nonfarm employment in the sample. Nonfarm employment is measured as the number of months of nonfarm activity performed during the year, including wage jobs and own-family businesses.

**TABLE 1--PROFILE OF NONFARM EMPLOYMENT IN THE SAMPLE**

	Mean	Standard deviation	Number of observations
<b>Sex</b>			
Male	3.802	4.601	1187
Female	1.567	3.658	1177
<b>Marital Status</b>			
Married	2.831	4.347	1735
Single	2.297	4.167	629
<b>Age</b>			
<18	0.406	1.781	255
18-24	4.744	4.936	310
25-34	3.525	4.603	525
35-44	3.261	4.439	477
44-54	2.585	4.281	358
55 and above	1.029	3.047	439
<b>Years of schooling</b>			
None	0.473	2.018	298
Primary	1.768	3.511	540
Secondary	2.932	4.400	1028
High school	4.402	4.923	425
Above	5.164	5.411	73
<b>Guanxi</b>			
No	2.520	4.171	1269
Yes	2.886	4.450	1095
Average	2.690	4.305	2364

Note: Nonfarm employment is measured as the months spent on nonfarm jobs, including own-family business.

Gender, marital status, age, education, and *guanxi* all appear to affect nonfarm employment. On average, men work about 3.8 months per year in nonfarm activities, more than two months longer than women, indicating a significant gender difference. Married rural laborers work longer in the nonfarm sector than single laborers. Workers under 18 years of age average only 0.4 months of nonfarm employment per year, but this increases to 4.7 months for those between 18 and 24 years old. Thereafter, the intensity of nonfarm activity gradually declines to about one month per year for workers older than 54 years. Education and nonfarm employment are strongly and positively correlated. Illiterate workers average less than half a month each year on nonfarm activity, while those with primary, secondary, and high school education work for about 1.8, 2.9, and 4.4 months, respectively. The duration of nonfarm employment for workers having *guanxi* is 0.3 months greater than those without *guanxi*.<sup>5</sup> The mean values by household mask differences between men and women. Men with *guanxi* have more nonfarm opportunities than those without *guanxi*. Because of the existence of a labor division by gender within households, the longer the husband works off-farm, the more likely the wife to stay home and engage in farm and housework. In order to quantify the impact of *guanxi* on nonfarm employment, a more formal analysis controlling for gender and other factors is needed.

---

<sup>5</sup> We will formally define *guanxi* variables in the next section. The *guanxi* used here is the Type IV as defined in Table 2.

#### 4. MODEL AND ESTIMATION

##### MODEL

Social networks provide information that affects nonfarm job searches. They also make one person's knowledge dependent upon the behavior of others in the same network. To quantify the effect of networks on nonfarm employment, we begin by assuming that a worker's nonfarm employment is given by:

$$(1) \quad D_{ij} = N_{ij}\mathbf{a} + X_i\mathbf{b} + Y_j\mathbf{g} + \mathbf{e}_{ij}$$

where  $i$  indexes individuals,  $j$  indexes villages,  $D_{ij}$  is the number of months per year engaged in nonfarm activity,  $N_{ij}$  defines the information content of the worker's social network,  $X_i$  measures a set of personal characteristics,  $Y_j$  is a set of local area characteristics, and  $\mathbf{e}_{ij}$  is a stochastic error term. The variables used in the analysis are defined in more detail in Table 2.

We include two social network variables. The first is a *guanxi* variable that is defined as 1 if any one of the four criteria in Table 2 are satisfied, and 0 otherwise. The second is the share of nonfarm employment in total village employment, which is included to capture the effect of networks and labor market development at the village level.

---

**TABLE 2--VARIABLE DEFINITIONS**


---

*Personal networks*

## TYPE I

- Having received help from family members or friends during the process of looking for a job.

## TYPE II

- Having received remittance from family members living in towns or cities.
- Having family members working outside own region.
- Having a family member as a local official.

## TYPE III

- Expenditure on gifts normalized by household size.

## TYPE IV

- TYPE I + TYPE II.

*Village nonfarm labor market development*

- The proportion of nonfarm employment in total labor force in a village.

*Personal characteristics and human capital*

- Age and the square of age.
- Gender.
- Marital status.
- Education: total years of schooling.
- Years of vocational training.
- Years of apprentice.

*Local characteristics (rural institutions and infrastructure)*

- The size of land holding.
  - The frequency of adjustments to land tenure arrangements.
  - The burden of agricultural tax in 1996.
  - The number of buses running through the village.
-

Apart from the network variables, we also control for personal characteristics, rural institutions, and infrastructure development. For personal characteristics, we include variables for education, age, marital status, and gender. A square term for age is added to capture any curvature of age against nonfarm employment. Because male workers engage in far more nonfarm employment than female workers (Matthews and Nee, 2000), we estimate the determinants of nonfarm employment for men and women separately. To capture the effects of rural institutions, we include land size, frequency of adjustments to land tenure systems, and the agricultural tax burden in 1994. If a household has a larger farm, family members may spend more time in agricultural production and therefore less time in nonfarm activities. Similarly, if the agricultural tax burden is heavy, farmers may have to put more effort into farming. The number of buses running through a village is included as an indicator of rural infrastructure development. A region with better transportation is expected to offer better opportunities for farmers to obtain nonfarm employment.

## ESTIMATION RESULTS

Because the number of months worked in nonfarm activities is double censored between 0 and 12, we use a Tobit model to estimate equation (1). Table 3 compares the estimates of the determinants of total nonfarm employment with and without the inclusion of the *guanxi* variable.

**TABLE 3--COMPARING THE EFFECT OF DIFFERENT TYPES OF GUANXI**

Variable	Type I	Type II	Type III	Type IV	No <i>guanxi</i>
Intercept	-31.792** (3.401)	-31.831** (3.501)	-29.858** (3.403)	-33.87** (3.504)	-21.552** (3.370)
<i>Guanxi</i>	4.206** (0.642)	1.501** (0.627)	0.001 (0.001)	3.227** (0.625)	
<b>Market Development</b>	2.630** (0.264)	2.803** (0.268)	2.852** (0.267)	2.878** (0.265)	
<b>Personal Characteristics</b>					
Age	0.982** (0.183)	1.006** (0.188)	0.921** (0.185)	1.070** (0.186)	0.918** (0.193)
Age*age	-0.013** (0.002)	-0.014** (0.002)	-0.013** (0.002)	-0.015** (0.002)	-0.013** (0.002)
Sex	7.682** (0.640)	7.713** (0.646)	7.746** (0.648)	7.761** (0.643)	7.715** (0.675)
Marital status	-3.164** (1.038)	-3.335** (1.049)	-3.449* (1.052)	-3.182** (1.041)	-3.718** (1.099)
<b>Human Capital</b>					
Education	0.942** (0.122)	0.918** (0.123)	0.919** (0.124)	0.905** (0.122)	0.982** (0.129)
Training	2.508** (0.708)	2.405** (0.719)	2.487** (0.722)	2.351** (0.712)	2.626** (0.756)
Apprentice	1.381** (0.510)	1.572** (0.516)	1.591** (0.517)	1.423** (0.513)	1.884* (0.544)
<b>Rural Institutions</b>					
Land size	-0.697** (0.150)	-0.724** (0.150)	-0.702** (0.150)	-0.748** (0.149)	-1.254** (0.1614)
Freq. of land tenure	-0.043 (0.146)	-0.076 (0.147)	-0.079 (0.147)	-0.030** (0.146)	-0.577** (0.149)
Ag. tax burden	-0.615** (0.262)	0.435* (0.263)	-0.468 (0.267)	-0.546** (0.262)	-0.080 (0.263)
<b>Rural Infrastructure</b>					
Number of bus	0.005 (0.009)	0.000 (0.009)	0.000 (0.009)	0.002 (0.009)	0.038** (0.009)
Log Likelihood	-2928.11	-2947.15	-2949.76	-2936.41	-3010.92

Note: - The dependent variable is the number of months engaged in any types of nonfarm jobs. \* and \*\* indicate statistical significance at the 10% and 5%, respectively.

- Four types of *guanxi* variable are considered in regressions. Type I defines those who have received help from friends or relatives during the job searching process having *guanxi*. Under the definition of Type II, an individual has *guanxi* if at least one of his/her family member acts as a local official, or works outside the town, or has received remittance from relatives or friends. Type III is defined as the gift expenditure normalized by household size. Type IV *guanxi* is combination of Type I and Type II.
- Sex and marital status are dummy variables. Sex=1 refers to men. Marital status =1 defines married.

We examined four alternative definitions of the *guanxi* variable to test its robustness. The four types of *guanxi* correspond to the definitions in Table 2. The coefficients for all the *guanxi* variables except for Type III are significant and positive, confirming its importance. The coefficient for Type I *guanxi* is larger than that for Type II. But since Type I *guanxi* only considers networks that were used during a job search, it is directly related to the outcome and hence imparts an upward bias that overstates the importance of *guanxi*. Since a person's social networks can be very complex, Type II captures only part of the entire networks due to data availability, thus likely understating the overall effects. The real impact of *guanxi* may lie between the estimates for these two definitions. Hence, Type IV, a combination of Types I and II, may well give a more accurate estimate. In the following analyses, we will focus on Type IV *guanxi*.

If *guanxi* variables are included, the coefficients for other variables in the model are affected. Importantly, the regression excluding *guanxi* has a larger coefficient (0.982) for education than does the regression including Type IV *guanxi* (0.905), confirming an expected upward bias in the returns to human capital in models that ignore *guanxi*.

All the personal characteristics and human capital variables are significant which is consistent with previous findings in the literature (Tuan, Somwaru, and Diao, 2000). Most rural institution variables also have significant explanatory power.

To obtain additional information on the contributions of different variables to nonfarm employment outcomes, we calculated the marginal impact of each variable at the sample means.<sup>6</sup> Table 4 presents these marginal effects.

---

<sup>6</sup> See Greene (1993) for details.

**TABLE 4--MARGINAL EFFECTS**

Variable	Type I	Type II	Type III	Type IV	No <i>guanxi</i>
Intercept	-7.750	-8.001	-6.527	-7.457	-4.162
<i>Guanxi</i>	1.025	0.377	0.000	0.710	
<b>Market Development</b>	0.641	0.705	0.623	0.634	
<b>Personal Characteristics</b>					
Age	0.239	0.253	0.201	0.236	0.177
Age*age	-0.003	-0.004	-0.003	-0.003	-0.002
Sex	1.873	1.939	1.693	1.709	1.490
Marital status	-0.771	-0.838	-0.754	-0.700	-0.718
<b>Human Capital</b>					
Education	0.230	0.231	0.201	0.199	0.190
Training	0.611	0.605	0.544	0.518	0.507
Apprentice	0.337	0.395	0.348	0.313	0.364
<b>Rural Institutions</b>					
Land size	-0.170	-0.182	-0.153	-0.165	-0.242
Land tenure adj.	-0.010	-0.019	-0.017	-0.007	-0.111
<b>Rural Infrastructure</b>					
Ag. tax burden	-0.150	0.109	-0.102	-0.120	-0.015
Number of buses	0.001	0.000	0.000	0.000	0.007

Note: The marginal effects are calculated by multiplying the estimated coefficients in Table 3 with the probability that the predicted value evaluated at the sample mean lies between 0 and 12.

The regression results that include *guanxi* variables are more similar to each other than to the regression without *guanxi*. For example, when *guanxi* is not included, the marginal effects of sex and land size are 1.49 and -0.242, respectively, which are quite different from the range of corresponding values of 1.693 to 1.939 and -0.153 to -0.182 obtained from the regressions that include *guanxi* variables. Another important finding from Table 4 is that the marginal effect of *guanxi* is almost as significant as gender in explaining nonfarm employment and it is more important than schooling. This confirms that

information networks are important in explaining how people find nonfarm jobs as well as their own skills and characteristics.

Gender has the largest positive impact of any variable on nonfarm employment, confirming a clear gender divide. We therefore estimated the determinants of nonfarm employment by gender and the results are reported in Table 5. Here we have used Type IV *guanxi* as our network variable.

**TABLE 5--NONFARM EMPLOYMENT BY GENDER**

Variable	Male	Male	Female	Female
Intercept	-28.029** (3.522)	-15.969** (3.458)	-41.733** (9.142)	-27.82** (8.79)
<i>Guanxi</i>	3.611** (0.636)		2.975* (1.548)	
<b>Market Development</b>	2.572** (0.267)		3.858** (0.673)	
<b>Personal Characteristics</b>				
Age	1.145** (0.183)	0.964** (0.192)	1.623** (0.527)	1.554** (0.543)
Age*age	-0.015** (0.002)	-0.012** (0.002)	-0.025** (0.007)	-0.023** (0.007)
Marital status	-0.122 (1.022)	-0.423 (1.097)	-11.736** (2.859)	- 13.059* * (2.999)
<b>Human Capital</b>				
Education	0.776** (0.131)	0.860** (0.141)	0.858** (0.291)	0.924** (0.303)
Training	1.218* (0.651)	1.485** (0.708)	7.108** (2.204)	7.366** (2.284)
Apprentice	1.048** (0.415)	1.473** (0.448)	5.606* (3.013)	6.810** (3.115)
<b>Rural Institutions</b>				
Land size	-0.886** (0.161)	-1.382** (0.178)	-0.531 (0.343)	-1.164** (0.363)
Land tenure adj.	0.014 (0.141)	-0.488** (0.148)	-0.191 (0.403)	-0.915** (0.404)
Ag. tax burden	-0.370 (0.254)	0.150 (0.264)	-0.998 (0.710)	-0.029 (0.685)
<b>Rural Infrastructure</b>				
Number of buses	-0.024** (0.010)	0.009 (0.010)	0.048** (0.022)	0.095** (0.022)
Log Likelihood	-1933.83	-1995.33	-927.60	-948.05

Note: The dependent variable is the number of months engaged in any types of nonfarm jobs. *Guanxi* variable used in this table is Type IV.

\* and \*\* indicate statistical significance at the 10% and 5% level, respectively. Figures in parentheses are standard errors.

Although the results are similar to Table 3, some features are still of interest. First, *guanxi* has a larger marginal effect for male workers than female workers. Moreover, the marginal effect of *guanxi* is larger for male workers than is the effect of village ties and market development (the proportion of people involved in local nonfarm activities), whereas the opposite is true for female workers. This result suggests that women are more likely to find jobs locally.

Marital status has a much larger effect on women than on men. The coefficients for this variable are negative but insignificant in the male worker equations, but are significantly negative in those for female workers. Marriage apparently plays little role in affecting men's nonfarm activities, but it significantly reduces a woman's chance to participate in nonfarm activities. After marriage, women are more likely to be left behind to work on the family farm and take care of their families. These results suggest a strong labor division between husband and wife and an obvious bias against women engaging in nonfarm jobs, conforming the findings of Matthews and Nee (2000). Interestingly, the coefficients for training and apprentice variables are much larger for women than for men, suggesting the importance of providing more vocational training for women.

Up to this point in the analysis, we have used the number of months worked in nonfarm jobs as the dependent variable with no distinction by job type. We now disaggregate total nonfarm employment into three types of nonfarm jobs – self-employment, and paid employment in construction and transportation activities or in industry and services. Table 6 reports the results.

**TABLE 6--THE EFFECT OF GUANXI ON DIFFERENT TYPES OF NONFARM JOBS**

Variable	Self-employment	Construction and transportation	Industry and services
Intercept	-32.392** (7.407)	-46.511** (6.519)	-65.862** (8.456)
<i>Guanxi</i>	-5.641** (1.325)	1.072 (0.965)	8.239** (1.457)
<b>Market Development</b>	0.374 (0.542)	1.035** (0.399)	4.936** (0.608)
<b>Personal Characteristics</b>			
Age	0.627 (0.393)	1.436** (0.333)	1.721** (0.005)
Age*age	-0.09* (0.005)	-0.021** (0.004)	-0.024** (0.005)
Sex	4.919** (1.315)	12.954** (1.356)	6.675** (1.387)
Marital status	2.745 (2.328)	0.089 (1.636)	-8.193** (2.277)
<b>Human Capital</b>			
Education	0.307 (0.253)	-0.061 (0.196)	1.682** (0.282)
Training	-0.642 (1.595)	0.179 (1.094)	5.716** (1.418)
Apprentice	1.496 (0.987)	1.861** (0.685)	0.785** (1.156)
<b>Rural Institutions</b>			
Land size	-1.040** (0.364)	-0.328 (0.239)	-0.903** (0.332)
Land tenure adj.	-0.357 (0.305)	-0.228* (0.231)	-0.304 (0.385)
Ag. tax burden	-0.538 (0.581)	0.260 (0.390)	-1.887** (0.596)
<b>Rural Infrastructure</b>			
Number of buses	0.075** (0.019)	-0.012 (0.015)	-0.025 (0.020)
<b>Log Likelihood</b>	<b>-1187.27</b>	<b>-1165.02</b>	<b>-1698.85</b>

Note: \* and \*\* indicate statistical significance at the 10% and 5% levels, respectively. Figures in parentheses are standard errors. The category of industry and service includes the following types of jobs: industry, real estate management, health care, public service, education, scientific and research services, banking and insurance services, government and other organizations.

*Guanxi* has a negative effect on self-employment but a positive effect on industry and service jobs. It seems that people having *guanxi* tend to find well-paid jobs in the industry and service sectors, while those without *guanxi* are more likely to take odd jobs locally. The human capital variables have large positive impacts on the industry and service jobs but insignificant and even negative effects on the other two types of jobs. Construction and transportation jobs require strong physical capability, therefore being young and male may be more important than being educated.

In sum, *guanxi* plays an important role in seeking nonfarm jobs but with a different impact on men and women. The coefficient for education is statistically positive for most model specifications, which is consistent with previous findings. However, the importance of education is mitigated once the social network variables are taken into account. After controlling for the *guanxi* variables, the estimated coefficients for the three human capital variables are reduced, suggesting that the contributions of these factors to nonfarm employment may be smaller than previously thought.

## 5. CONCLUSIONS

This paper examines the determinants of nonfarm employment in rural China using a rural household survey. Most studies of China's rural labor market have focused on the effects of personal characteristics and human capital in rural labor markets and have overlooked the potential role of social networks. In this paper, we demonstrate the importance of social networks (*guanxi*) in determining employment in nonfarm activities. Social networks help facilitate nonfarm job market information in situations where formal institutions and channels are lacking. In these situations, individual nonfarm employment

behavior depends not only on personal characteristics but also on access to information within social networks.

*Guanxi* is found to be one of the most important contributing factors to nonfarm employment next to gender. Personal ties to outside their villages have a larger impact on men than on women in providing nonfarm opportunities, while the development of nonfarm activities within a village has a greater impact on women. When *guanxi* is taken into account, the importance of other variables, such as human capital and rural institutions, becomes less significant. With limited nonfarm job opportunities and imperfect market information, social networks play a key role in enabling rural workers to more fully capitalize on their education and skills. These findings help explain the observed clustering of rural migrants in cities who originate from the same rural areas.

*Guanxi* has a larger influence on male labor than on female labor in determining nonfarm employment, suggesting segmentation of the labor market along gender lines. Marriage has a negligible effect on men's nonfarm activities. However, after women get married, their chance to engage in nonfarm employment will decline to a large degree. This result suggests an apparent labor division between the husband and wife within a household. Under this division, men are more likely to earn cash income from outside while women are expected to take care of the land and family. Providing women more vocational training will enhance their opportunities to work in the nonfarm sector.

Given the importance of *guanxi* in China's labor market, the government might want to consider using it to facilitate a more equitable pattern of nonfarm development across regions. In China, each year, there are hundreds of thousands of veterans retired from the military. Current policy requires veterans to return to their places of their origin, but the

government might want to consider granting veterans more freedom to choose where to live after retirement. If veterans settled in areas where they knew there were reasonable nonfarm job opportunities they might also become useful sources of information and contact persons for workers back in their home areas. Given the broad regional recruitment by the military, such a policy would help spread job market information more generally within the country, including regions that currently have few people working outside, such as Liaoning Province.

Policies to capitalize on *guanxi* could contribute to greater labor market efficiencies. But *guanxi* is not costless and it inevitably excludes many viable workers and hence is second best to more open labor market information systems. In the long run, the government should work towards reducing labor market imperfections by facilitating broader dissemination of market information circulation (e.g. through radio and television, the internet, and credit reference bureaus), and removing barriers to rural-urban and inter-regional migration.

## REFERENCES

- Banerjee, B. 1983. The role of the informal sector in the migration process: A test of probabilistic migration models and labor market segmentation for India. *Oxford Economic Papers*, 35: 417-18.
- Bian, Yanjie. 1994. Guanxi and the allocation of urban jobs in China. *China Quarterly*, December, 140: 971-99.
- Greene, William H. 1993. *Econometric Analysis*. New Jersey: Prentice-Hall.
- Glewwe, Paul and Margaret Grosh. 1998. "The World Bank's Living Standards Measurement Study Household Surveys," *Journal of Economic Perspective*, 12(1): 181-196.
- Guthrie, Douglas. 1998. The Declining Significance of Guanxi in China's Economic Transition. *China Quarterly*, June, 158: 369-93.
- Li Shuhe and Shaomin Li, 2000. Guanxi: Just like traffic cops. *China Economic Quarterly*, Spring, 4: (1).
- Lovett, Steve, Lee C. Simmons, and Raja Kai. 1999. Guanxi versus market: ethics and efficiency. *Journal of International Business Studies*, 30(2): 231-248.
- Matthews, Rebecca and Victor Nee. 2001. Gender inequality and economics growth in rural China. *Social Science Research*, forthcoming.
- Meng, Xin. 1990. The rural labor market. In *China's rural industry: Structure, development, and reform*, ed. Byrd, Williams and Lin Qingsong. Oxford, UK: Oxford University Press, published for the World Bank, 299-322.
- Montgomery, James F. 1991. Social networks and labor-market outcomes: Toward an economic analysis. *American Economics Review*, 81: 1408-1418.
- Nee, Victor. 1996. The emergence of a market society: Changing mechanisms of stratification in China. *American Journal of Sociology* 101 (4): 908-949.
- Rosegrant, Mark W. and Peter B.R. Hazell. 2000. *Transforming the rural Asian economy: The unfinished revolution*. Hong Kong: Oxford University Press. Published for the Asian Development Bank.
- Rozelle, Scott. 1994. Rural industrialization and increasing inequality: Emerging patterns in China's reforming economy. *Journal of Comparative Economics*, December, 19, 3:362-391.

- Rozelle, Scott, L. Guo, M. Sheng, A. Hughart, and J. Giles. 1999. Leaving China's farms: survey results of new paths and remaining hurdles to rural migration. *China Quarterly*, (158): 367-93.
- State Statistical Bureau (SSB). 1999. *China statistical yearbook*. Beijing: China Statistical Press.
- State Statistical Bureau (SSB). 2000. *The summary statistics of China's first agricultural census*. Beijing: China Statistical Press.
- Tuan, Francis, Agapi Somwaru, and Xinsheng Diao. 2000. *Rural labor migration, characteristics, and employment patterns: A study based on China's agricultural census*. Trade and Macroeconomics Division Discussion Paper No. 63. Washington, DC: International Food Policy Research Institute.
- Wu, Harry X. 1994. The rural industrial enterprise workforce. In *Rural enterprises in China*, ed. C. Findlay, A. Watson, and H. Wu. New York: St. Martin's Press.
- Yang, Dannis. 1997. Education and off-farm work. *Economics Development and Cultural Change*, 45: 613-32.
- Yang, Mayfair. 1994. *Gifts, favors and banquets: The art of social relationships in China*. Ithaca, NY: Cornell University.
- Zhao, Yaohui. 1999. "Labor migration and earnings differences: The case of rural China. *Economic Development and Cultural Change*, 47(4): 767-82.

## EPTD DISCUSSION PAPERS

---

### LIST OF EPTD DISCUSSION PAPERS

- 01 *Sustainable Agricultural Development Strategies in Fragile Lands*, by Sara J. Scherr and Peter B.R. Hazell, June 1994.
  - 02 *Confronting the Environmental Consequences of the Green Revolution in Asia*, by Prabhu L. Pingali and Mark W. Rosegrant, August 1994.
  - 03 *Infrastructure and Technology Constraints to Agricultural Development in the Humid and Subhumid Tropics of Africa*, by Dunstan S.C. Spencer, August 1994.
  - 04 *Water Markets in Pakistan: Participation and Productivity*, by Ruth Meinzen-Dick and Martha Sullins, September 1994.
  - 05 *The Impact of Technical Change in Agriculture on Human Fertility: District-level Evidence From India*, by Stephen A. Vosti, Julie Witcover, and Michael Lipton, October 1994.
  - 06 *Reforming Water Allocation Policy Through Markets in Tradable Water Rights: Lessons from Chile, Mexico, and California*, by Mark W. Rosegrant and Renato Gazri S, October 1994.
  - 07 *Total Factor Productivity and Sources of Long-Term Growth in Indian Agriculture*, by Mark W. Rosegrant and Robert E. Evenson, April 1995.
  - 08 *Farm-Nonfarm Growth Linkages in Zambia*, by Peter B.R. Hazell and Behjat Hoijati, April 1995.
  - 09 *Livestock and Deforestation in Central America in the 1980s and 1990s: A Policy Perspective*, by David Kaimowitz (Interamerican Institute for Cooperation on Agriculture), June 1995.
  - 10 *Effects of the Structural Adjustment Program on Agricultural Production and Resource Use in Egypt*, by Peter B.R. Hazell, Nicostrato Perez, Gamal Siam, and Ibrahim Soliman, August 1995.
  - 11 *Local Organizations for Natural Resource Management: Lessons from Theoretical and Empirical Literature*, by Lise Nordvig Rasmussen and Ruth Meinzen-Dick, August 1995.
  - 12 *Quality-Equivalent and Cost-Adjusted Measurement of International Competitiveness in Japanese Rice Markets*, by Shoichi Ito, Mark W. Rosegrant, and Mercedita C. Agcaoili-Sombilla, August 1995.
-

## EPTD DISCUSSION PAPERS

---

- 13 *Role of Inputs, Institutions, and Technical Innovations in Stimulating Growth in Chinese Agriculture*, by Shenggen Fan and Philip G. Pardey, September 1995.
  - 14 *Investments in African Agricultural Research*, by Philip G. Pardey, Johannes Roseboom, and Nienke Beintema, October 1995.
  - 15 *Role of Terms of Trade in Indian Agricultural Growth: A National and State Level Analysis*, by Peter B.R. Hazell, V.N. Misra, and Behjat Hoijati, December 1995.
  - 16 *Policies and Markets for Non-Timber Tree Products*, by Peter A. Dewees and Sara J. Scherr, March 1996.
  - 17 *Determinants of Farmers' Indigenous Soil and Water Conservation Investments in India's Semi-Arid Tropics*, by John Pender and John Kerr, August 1996.
  - 18 *Summary of a Productive Partnership: The Benefits from U.S. Participation in the CGIAR*, by Philip G. Pardey, Julian M. Alston, Jason E. Christian, and Shenggen Fan, October 1996.
  - 19 *Crop Genetic Resource Policy: Towards a Research Agenda*, by Brian D. Wright, October 1996.
  - 20 *Sustainable Development of Rainfed Agriculture in India*, by John M. Kerr, November 1996.
  - 21 *Impact of Market and Population Pressure on Production, Incomes and Natural Resources in the Dryland Savannas of West Africa: Bioeconomic Modeling at the Village Level*, by Bruno Barbier, November 1996.
  - 22 *Why Do Projections on China's Future Food Supply and Demand Differ?* by Shenggen Fan and Mercedita Agcaoili-Sombilla, March 1997.
  - 23 *Agroecological Aspects of Evaluating Agricultural R&D*, by Stanley Wood and Philip G. Pardey, March 1997.
  - 24 *Population Pressure, Land Tenure, and Tree Resource Management in Uganda*, by Frank Place and Keijiro Otsuka, March 1997.
  - 25 *Should India Invest More in Less-favored Areas?* by Shenggen Fan and Peter Hazell, April 1997.
-

## EPTD DISCUSSION PAPERS

---

- 26 *Population Pressure and the Microeconomy of Land Management in Hills and Mountains of Developing Countries*, by Scott R. Templeton and Sara J. Scherr, April 1997.
  - 27 *Population Land Tenure and Natural Resource Management: The Case of Customary Land Area in Malawi*, by Frank Place and Keijiro Otsuka, April 1997.
  - 28 *Water Resources Development in Africa: A Review and Synthesis of Issues, Potentials, and Strategies for the Future*, by Mark W. Rosegrant and Nicostrato D. Perez, September 1997.
  - 29 *Financing Agricultural R&D in Rich Countries: What's Happening and Why?* by Julian M. Alston, Philip G. Pardey, and Vincent H. Smith, September 1997.
  - 30 *How Fast Have China's Agricultural Production and Productivity Really Been Growing?* by Shenggen Fan, September 1997.
  - 31 *Does Land Tenure Insecurity Discourage Tree Planting? Evolution of Customary Land Tenure and Agroforestry management in Sumatra*, by Keijiro Otsuka, S. Suyanto, and Thomas P. Tomich, December 1997.
  - 32 *Natural Resource Management in the Hillside of Honduras: Bioeconomic Modeling at the Micro-Watershed Level*, by Bruno Barbier and Gilles Bergeron, January 1998.
  - 33 *Government Spending, Growth, and Poverty: An Analysis of Interlinkages in Rural India*, by Shenggen Fan, Peter Hazell, and Sukhadeo Thorat, March 1998. Revised December 1998.
  - 34 *Coalitions and the Organization of Multiple-Stakeholder Action: A Case Study of Agricultural Research and Extension in Rajasthan, India*, by Ruth Alsop, April 1998.
  - 35 *Dynamics in the Creation and Depreciation of Knowledge and the Returns to Research*, by Julian Alston, Barbara Craig, and Philip Pardey, July, 1998.
  - 36 *Educating Agricultural Researchers: A Review of the Role of African Universities*, by Nienke M. Beintema, Philip G. Pardey, and Johannes Roseboom, August 1998.
  - 37 *The Changing Organizational Basis of African Agricultural Research*, by Johannes Roseboom, Philip G. Pardey, and Nienke M. Beintema, November 1998.
  - 38 *Research Returns Redux: A Meta-Analysis of the Returns to Agricultural R&D*, by Julian M. Alston, Michele C. Marra, Philip G. Pardey, and T.J. Wyatt, November 1998.
-

## EPTD DISCUSSION PAPERS

---

- 39 *Technological Change, Technical and Allocative Efficiency in Chinese Agriculture: The Case of Rice Production in Jiangsu*, by Shenggen Fan, January 1999.
  - 40 *The Substance of Interaction: Design and Policy Implications of NGO-Government Projects in India*, by Ruth Alsop with Ved Arya, January 1999.
  - 41 *Strategies for Sustainable Agricultural Development in the East African Highlands*, by John Pender, Frank Place, and Simeon Ehui, April 1999.
  - 42 *Cost Aspects of African Agricultural Research*, by Philip G. Pardey, Johannes Roseboom, Nienke M. Beintema, and Connie Chan-Kang, April 1999.
  - 43 *Are Returns to Public Investment Lower in Less-favored Rural Areas? An Empirical Analysis of India*, by Shenggen Fan and Peter Hazell, May 1999.
  - 44 *Spatial Aspects of the Design and Targeting of Agricultural Development Strategies*, by Stanley Wood, Kate Sebastian, Freddy Nachtergaele, Daniel Nielsen, and Aiguo Dai, May 1999.
  - 45 *Pathways of Development in the Hillsides of Honduras: Causes and Implications for Agricultural Production, Poverty, and Sustainable Resource Use*, by John Pender, Sara J. Scherr, and Guadalupe Durón, May 1999.
  - 46 *Determinants of Land Use Change: Evidence from a Community Study in Honduras*, by Gilles Bergeron and John Pender, July 1999.
  - 47 *Impact on Food Security and Rural Development of Reallocating Water from Agriculture*, by Mark W. Rosegrant and Claudia Ringler, August 1999.
  - 48 *Rural Population Growth, Agricultural Change and Natural Resource Management in Developing Countries: A Review of Hypotheses and Some Evidence from Honduras*, by John Pender, August 1999.
  - 49 *Organizational Development and Natural Resource Management: Evidence from Central Honduras*, by John Pender and Sara J. Scherr, November 1999.
  - 50 *Estimating Crop-Specific Production Technologies in Chinese Agriculture: A Generalized Maximum Entropy Approach*, by Xiaobo Zhang and Shenggen Fan, September 1999.
  - 51 *Dynamic Implications of Patenting for Crop Genetic Resources*, by Bonwoo Koo and Brian D. Wright, October 1999.
-

## EPTD DISCUSSION PAPERS

---

- 52 *Costing the Ex Situ Conservation of Genetic Resources: Maize and Wheat at CIMMYT*, by Philip G. Pardey, Bonwoo Koo, Brian D. Wright, M. Eric van Dusen, Bent Skovmand, and Suketoshi Taba, October 1999.
- 53 *Past and Future Sources of Growth for China*, by Shenggen Fan, Xiaobo Zhang, and Sherman Robinson, October 1999.
- 54 *The Timing of Evaluation of Genebank Accessions and the Effects of Biotechnology*, by Bonwoo Koo and Brian D. Wright, October 1999.
- 55 *New Approaches to Crop Yield Insurance in Developing Countries*, by Jerry Skees, Peter Hazell, and Mario Miranda, November 1999.
- 56 *Impact of Agricultural Research on Poverty Alleviation: Conceptual Framework with Illustrations from the Literature*, by John Kerr and Shashi Kolavalli, December 1999.
- 57 *Could Futures Markets Help Growers Better Manage Coffee Price Risks in Costa Rica?* by Peter Hazell, January 2000.
- 58 *Industrialization, Urbanization, and Land Use in China*, by Xiaobo Zhang, Tim Mount, and Richard Boisvert, January 2000.
- 59 *Water Rights and Multiple Water Uses: Framework and Application to Kirindi Oya Irrigation System, Sri Lanka*, by Ruth Meinzen-Dick and Margaretha Bakker, March 2000.
- 60 *Community natural Resource Management: The Case of Woodlots in Northern Ethiopia*, by Berhanu Gebremedhin, John Pender and Girmay Tesfaye, April 2000.
- 61 *What Affects Organization and Collective Action for Managing Resources? Evidence from Canal Irrigation Systems in India*, by Ruth Meinzen-Dick, K.V. Raju, and Ashok Gulati, June 2000.
- 62 *The Effects of the U.S. Plant Variety Protection Act on Wheat Genetic Improvement*, by Julian M. Alston and Raymond J. Venner, May 2000.
- 63 *Integrated Economic-Hydrologic Water Modeling at the Basin Scale: The Maipo River Basin*, by M. W. Rosegrant, C. Ringler, D.C. McKinney, X. Cai, A. Keller, and G. Donoso, May 2000.
- 64 *Irrigation and Water Resources in Latin America and the Caribbean: Challenges and Strategies*, by Claudia Ringler, Mark W. Rosegrant, and Michael S. Paisner, June 2000.
-

## EPTD DISCUSSION PAPERS

---

- 65 *The Role of Trees for Sustainable Management of Less-favored Lands: The Case of Eucalyptus in Ethiopia*, by Pamela Jagger & John Pender, June 2000.
- 66 *Growth and Poverty in Rural China: The Role of Public Investments*, by Shenggen Fan, Linxiu Zhang, and Xiaobo Zhang, June 2000.
- 67 *Small-Scale Farms in the Western Brazilian Amazon: Can They Benefit from Carbon Trade?* by Chantal Carpentier, Steve Vosti, and Julie Witcover, September 2000.
- 68 *An Evaluation of Dryland Watershed Development Projects in India*, by John Kerr, Ganesh Pangare, Vasudha Lokur Pangare, and P.J. George, October 2000.
- 69 *Consumption Effects of Genetic Modification: What If Consumers Are Right?* by Konstantinos Giannakas and Murray Fulton, November 2000.
- 70 *South-North Trade, Intellectual Property Jurisdictions, and Freedom to Operate in Agricultural Research on Staple Crops*, by Eran Binenbaum, Carol Nottenburg, Philip G. Pardey, Brian D. Wright, and Patricia Zambrano, December 2000.
- 71 *Public Investment and Regional Inequality in Rural China*, by Xiaobo Zhang and Shenggen Fan, December 2000.
- 72 *Does Efficient Water Management Matter? Physical and Economic Efficiency of Water Use in the River Basin*, by Ximing Cai, Claudia Ringler, and Mark W. Rosegrant, March 2001.
- 73 *Monitoring Systems for Managing Natural Resources: Economics, Indicators and Environmental Externalities in a Costa Rican Watershed*, by Peter Hazell, Ujjayant Chakravorty, John Dixon, and Rafael Celis, March 2001.
-