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Leaving the Countryside: Rural-to-Urban Migration Decisions in China

By YAOHUI ZHAO*

The migration of rural labor to urban areas in China since the mid-1980's has created the largest labor flow in world history. A commonly cited figure puts the number of rural migrants residing in urban areas at 50 million in the mid-1990's. Seemingly, Chinese rural people are fully responding to the relaxation of long-standing controls over rural-to-urban migration. However, I will show in this paper that, in spite of the incentive and ability to migrate, many rural people choose not to migrate. A major reason is the existing arrangement of land management.

Due to the Chinese government's long-standing policy of restricting migration from rural to urban areas, a large urban-rural income gap developed.¹ This large urban-rural gap provides a tremendous incentive to migrate to urban areas. In spite of this incentive, Chinese rural families have not been willing to migrate permanently to urban areas. This is manifested in two ways. First, the majority of workers and families do not participate in migration at all. Second, the migration that does occur is largely circular. According to sample-survey research conducted in Sichuan, the majority of migrants spent less than nine months outside their homes in 1995.²

How can one explain the unwillingness of the Chinese people to migrate? Most of existing empirical studies have found significant effects of individual, household, and community characteristics upon the migration decision

(Denise Hare and Shukai Zhao, 1999; Hein Mallee, 1999; Xin Meng, 1999; Zhao, 1999). This implies that lack of ability or information provides only a partial explanation. A few studies have also examined the role of institutional constraints in reducing rural-to-urban migration (Dennis T. Yang, 1997; Zhao, 1999).

This paper employs a simple theoretical model of labor allocation within rural households, given existing land arrangements in an attempt to explain why rural Chinese do not fully participate in labor migration. It first explores the mechanisms by which individual, household, and community characteristics affect the migration decision. Empirical results are then presented to substantiate the derived hypotheses. The paper further explores the question of whether the migration decision is permanent by analyzing the responses of household consumption to income from migration.

I. Theoretical Model

Assume that a rural household maximizes its total labor income by allocating a fixed labor resource (\bar{L}) between farm and non-farm activities. Assume also, for the sake of simplicity, that nonfarm work is available only through wage employment in urban areas. The resulting wage rate (w) is discounted by the prospect of unemployment in urban areas and the costs associated with migration (including psychic costs). Farm production technology is summarized by a production function,

$$y = f(\ell, k, n)$$

where ℓ , k , and n stand for farm labor input, capital inputs (seed, fertilizer, machinery,

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¹ There have been several estimates of this gap. See, for example, Laiyun Sheng and Meijun Sun (1994) and Zhao (1999).

² I explain the sample in Section II.

etc.), and land input. I assume that the technology has the properties that marginal products of inputs are all positive and cross derivatives are nonnegative. The objective function of the household is thus written as:

$$\max_{\{\ell \geq 0, k \geq 0, n \geq 0\}} \{pf(\ell, k, n) - rk - sn + w(\bar{L} - \ell)\}$$

where p is the price vector of agricultural products, r is the rental rate of capital, s is the rental rate of land input, and $\bar{L} - \ell$ is the number of migrant laborers in the household.

Some modifications of the model are necessary because of agricultural institutions specific to China. First, the amount of land is more or less fixed for each household and is nontransferable. Agricultural land in China is collectively owned. While rural households have the right to use the land which has been allocated to them, they do not have the right to sell it. Although the central government has legalized subleasing of land in recent years, for various reasons subleasing has been extremely rare. In more formal terms, the opportunity cost of land is nearly zero; the returns to land are embodied in labor and thus constitute part of the farm labor income. For this reason, the size of land (\bar{n}) is treated as exogenous in the model, and its rent is eliminated from the objective function.

Second, even though farming the land may not be profitable for the household due to various short-term reasons (e.g., price, taxation, etc.), if the land is left idle then the household will face the risk of losing the right to it. Because land is a valuable asset in the long run (if not in the short run), I assume that rural households must supply a positive amount of labor to farming. Thus the land-rights system can be considered as imposing a constraint of minimum labor supply to farming (\underline{L}) on the household. The objective function of the household is thus written as follows:

$$\max_{\{\ell, k\}} \{pf(\ell, k, \bar{n}) - rk + w(\bar{L} - \ell)\}$$

subject to $\underline{L} \leq \ell \leq \bar{L}$. The Kuhn-Tucker first-order conditions of the optimization problem are

$$pf_{\ell}(\ell, k, \bar{n}) - w = \begin{cases} > 0 & \text{if } \ell = \bar{L} \\ < 0 & \text{if } \ell = \underline{L} \\ = 0 & \text{if } \underline{L} < \ell < \bar{L} \end{cases}$$

$$pf_k(\ell, k, \bar{n}) - r = 0.$$

The following hypotheses can be made from comparative-static analyses. The effects are expected to take place on both the intensive margin (i.e., migrant families increase their migration intensity) and the extensive margin (i.e., nonmigrant families become migrant families).

- (i) $d\ell/d\bar{n} \geq 0$.—More land in the household will increase the amount of farm labor, and thus will reduce the supply of migrant labor.
- (ii) $d\ell/dw \leq 0$.—Higher discounted wage rates in urban jobs will attract more migrants. The discount factors may include age, gender, marital status, and other personal and household characteristics.
- (iii) Obviously, since the number of migrants is total labor supply minus the number of farm laborers, households with more labor (\bar{L}) will supply more migrants.

For the last hypothesis, I examine the effect of rural taxation on labor allocation. Most of the rural taxes are collected on land, so it is a fixed amount for a household. The tax may affect the participation of rural households in farming. Suppose that there is only one laborer in farming. If his labor income from farming net of the land tax is lower than his alternative discounted urban wage rate, then this last farm laborer will shift to migratory work while managing to supply a minimum level of labor required for keeping the land. Maintaining a minimum presence of farm labor is made easier if the household has school-age children. Therefore, the land tax, by driving farm labor supply to its lower bound, is expected to affect the decision on labor migration. The effect comes from two sources: migrant families

increase the number of migrants and non-migrant families turn into migrant families.

II. Data and Empirical Analysis

The data set includes rural household surveys conducted in Sichuan province in China for the years 1994 and 1995. Sichuan is the most populous province, it is predominantly rural, and it is located in the interior of China. In recent years, it has been the largest exporter of rural labor. The survey of migrants was conducted during the Chinese lunar New Year in 1996 when most migrant people were staying at their rural homes. The sample included 1,820 households and 7,410 individuals.

In this paper, I define a migrant household as having at least one person working outside the home country for any positive number of months during the year. By this criterion, 9.2 percent of the labor force or 20.0 percent of the households migrated in 1994; and 8.7 percent of the labor force or 19.5 percent of the households migrated in 1995. Table 1 summarizes individual, household, and village characteristics for migrants and nonmigrants in the Sichuan sample in 1995.

In previous econometric work on individuals' migration decisions (Zhao, 1999), using the same sample as that used in this paper, I have examined the effects of personal characteristics on the migration decision. Specifically, age was identified as negatively affecting the probability of migration; female workers were less likely to migrate; and marriage also reduced the probability of migration. All of these effects were significant, both statistically and in magnitude. Schooling was found to have an insignificant effect on raising the probability of migration, but a significant effect in terms of raising the probability for local nonfarm work. In this paper, I will not duplicate the individual-choice model; instead I will focus on the effects of household characteristics.

Table 2 presents a logistic model of the migration decision using pooled household data for 1994 and 1995. The table also presents marginal effects of explanatory variables on the probability of migration. The marginal effect for a continuous independent variable is evaluated at the sample mean and that for a

TABLE 1—COMPARISON OF INDIVIDUAL, HOUSEHOLD, AND VILLAGE CHARACTERISTICS OF MIGRANTS AND NONMIGRANTS IN SICHUAN PROVINCE, 1995 SURVEY RESULTS

Characteristics	Migrants ^a	Nonmigrants
Labor characteristics		
Average age	26.8	36.4
Number of years of schooling	7.6	6.3
Percentage male	72.5	49.6
Percentage married	49.8	81.3
Household characteristics		
Household size	4.4	4.0
Number of laborers	3.4	2.7
Number of preschool children	0.2	0.2
Number of children at school	0.5	0.6
Size of per capita cultivated land (mu)	1.3	1.8
Per capita net rural income (1995 yuan)	1,042.0	1,225.8
Tax paid (1995 yuan)	96.0	84.0
Cash at beginning of year 1995	1,069.4	1,258.8
Village characteristics		
Percentage with paved road connection	89.2	93.0
Percentage with telephone connection	6.2	14.9
Percentage in minority areas	0.3	2.6
Percentage located in plains	2.3	16.6
Percentage located in hills	89.5	65.6

^a In 1995, 8.7 percent of laborers or 19.5 percent of households migrated.

categorical variable is evaluated against the reference category.

As can be seen from Table 2, the number of laborers in a household and its landholding were important factors determining the migration decision. Holding land size and the rest of the variables constant, increasing the number of family laborers by one raised the probability of migration by 8.4 percentage points, or 42 percent. Decreasing the size of household land by one mu increased the probability of migration by 2.8 percentage points, or 14 percent. Both results provide strong support for the hypotheses made in the theoretical model.

TABLE 2—LOGISTIC MODEL OF MIGRATION CHOICE
(DEPENDENT VARIABLE: MIGRANT FAMILY = 1;
NONMIGRANT FAMILY = 0)

A. Regression Results:

Explanatory variable	Coefficient estimate	Standard error	$\partial(\text{prob})/\partial x_i$ (percent)
Intercept	-1.00*	0.45	—
Mean age	-0.04**	0.01	-0.513
Mean schooling	-0.06**	0.02	-0.71
Number of laborers	0.70**	0.05	8.42
Preschool children	-0.07	0.10	-0.80
School children	0.14 [†]	0.07	1.63
Land	-0.23**	0.03	-2.81
Cash	-0.01**	0.00	-0.16
Tax	0.08**	0.02	0.95
Road	-0.31*	0.16	-4.05
Phone	-0.60**	0.17	-6.18
Minority	-1.95**	0.61	-12.49
Plain	-1.30**	0.30	-6.59
Hills	0.90**	0.17	10.81
Year	-0.10	0.09	-1.26

B. Definitions:

Explanatory variable	Definition
Intercept	Intercept
Mean age	Average age of laborers
Mean schooling	Average number of years of schooling of laborers
Number of laborers	Number of laborers in a household
Preschool children	Number of preschool children
School children	Number of school children
Land	Household land size (mu)
Cash	Cash holding at beginning of year (100's of yuan)
Tax	Tax paid by the household during the year (100's of yuan)
Road	Dummy variable for paved road access to the village
Phone	Dummy variable for telephone connection to the village
Minority	Dummy variable for minority nationalities
Plain	Area dummy: reference = mountainous area
Hills	Area dummy: reference = mountainous area
Year	Year dummy: 1995 = 1

Notes: For part A, sample size = 3,625, number of migrant families = 716; pseudo- R^2 = 0.24. The marginal effect for a dummy variable is the difference in probability of migration relative to the reference group; for continuous variables, the effect is evaluated at the mean.

[†] Statistically significant at the 10-percent level.

* Statistically significant at the 5-percent level.

** Statistically significant at the 1-percent level.

The number of preschool children had a negative effect on migration, but the effect was not statistically significant. The number of children at school had positive effects on migration, which implies that these children played the role of safeguarding the household's land rights by supplying a minimum amount of farm labor.

Rural taxation proved to affect the migration decision, but the effect seemed to be small: raising the amount of tax on a household by 100 yuan increased the probability of migration by approximately 1 percentage point, or 5 percent. The small magnitude is expected because as I have shown in the theoretical model, taxation takes effect only when it is unprofitable for the last farm laborer to continue farming. When a household that has already diversified labor between migrant and farming activities abandons farming, the effect will not show up in the sample. The household remains a migrant household although its farm labor supply may have decreased to the minimum level sufficient for maintaining its presence in farming and keeping the land. Only when a household that had previously specialized in farming switches to migration with a minimum farm labor supply would the dependent variable change value. The fact that such an extreme reaction showed up as statistically significant in the model implies that farmers' migration decisions responded to rural taxation. Moreover, rising rural taxation in recent years might have played a role in driving farm laborers to urban employment.

Other variables that are found to significantly affect the migration decision include age and schooling of the laborers, cash-holding by the household at the beginning of a decision period, geographic location of the village, access to the outside world via paved roads and telephones, and whether the village is in a minority area.

III. Migration as a Temporary Decision

I have examined how individual, household, and community characteristics affect the migration decision. There is one remaining question: is the choice of migration a long-term arrangement for the households? One way to answer this question is to look at the con-

sumption behavior of the household. According to the permanent-income hypothesis (Milton Friedman, 1957), if a household expects to receive a stream of earnings for a long period of time, then its consumption will increase correspondingly; if the income is temporary, then consumption will not increase proportionally with income.

Using the same data set, I constructed a consumption model for the surveyed households. In the model, a household's per capita rural consumption (i.e., excluding the consumption of migrants' urban consumption) is regressed against income from migration sources that is available for consumption by household members at the rural home, net income from local sources, and a host of household characteristics. The results are shown in Table 3.

Household characteristics such as household size, structure, housing space, the availability of electricity, and geographic location of the household are among the controlling variables in the model whose effects are left undiscussed in this paper. I focus on the income variables here. Migration income was defined as the income received by migrants minus their urban consumption, so this represents income available for consumption by family members remaining in their rural homes and the migrants themselves during the period when they lived with their families. Regression results show that migration income had a very small effect on consumption by the migrants' families: increasing migration income by 1 percent raised rural consumption by 0.005 percent. On the contrary, rural income had a very large impact on rural consumption: increasing rural net income by 1 percent increased household consumption by 0.4 percent. These results imply that rural household take the income from migration as transient income that cannot be depended on in the long run, and that the migration decision is largely a temporary decision.

IV. Conclusions and Discussion

This study has explored the migration decisions of households in rural China using a household survey in Sichuan province. It answers two questions. First, what determines the migration decision? Second, is

TABLE 3—HOUSEHOLD CONSUMPTION MODEL, SICHUAN SAMPLE, 1994–1995 (DEPENDENT VARIABLE: LOGARITHM OF THE VALUE OF HOUSEHOLD'S RURAL PER CAPITA CONSUMPTION)

A. Regression Results:		
Explanatory variable	Coefficient estimate	Standard error
Intercept	4.073**	0.105
Number of consumers	−0.099**	0.007
No kids	0.039	0.043
Two generation	0.053*	0.026
Three generation	0.054†	0.029
Electricity	0.019	0.036
Housing space	0.004**	0.001
Children	−0.012**	0.034
Male	0.002	0.038
Plain	0.138**	0.025
Hills	0.010	0.019
Log(migrant income)	0.005*	0.002
Log(rural income)	0.420**	0.012
Year	0.093**	0.013
B. Definitions:		
Explanatory variable	Definition	
Intercept	Intercept	
Number of consumers	Number of consumers in a household	
No kids	Dummy: household had no children	
Two generation	Dummy: two-generation household	
Three generation	Dummy: three-generation household	
Electricity	Dummy: the household had electricity	
Housing space	Housing space; 10-square-meter units	
Children	Proportion of population under 15 years of age $\times 10$	
Male	Proportion of male in the household $\times 10$	
Plain	Area dummy: plain = 1	
Hills	Area dummy: hill = 1	
Log(migrant income)	Logarithm of (migrant income – migrant consumption + 1)	
Log(rural income)	Logarithm of (rural income + 1)	
Year	Year dummy: 1994 as reference	

Notes: For part A, sample size = 3,632; adjusted R^2 = 0.416.

† Statistically significant (different from 0) at the 10-percent significance level.

* Statistically significant at the 5-percent significance level.

** Statistically significant at the 1-percent significance level.

migration a temporary or a permanent choice for the household? Empirical results are consistent with the hypothesis that rural households make labor-allocation choices based on comparing marginal returns to labor in farming and alternative employment. Major findings are as follows.

First, the shortage of farmland and the abundance of household labor are among the most important determinants of labor migration because they reduce the relative marginal income from labor in farming. This implies that, in order to raise incomes from farming, more transfer of labor out of agriculture and voluntary consolidation of land is needed, but as the analysis has shown, the current landownership system is an obstacle to further increases in labor productivity in farming.

Second, rural taxation has a statistically significant effect on the migration decision because it reduces the amount of income derived from agricultural production by the last farm laborer. In recent years, rural taxation in China has become an increasingly serious issue. As a result, able and strong laborers increasingly work in nonfarm sectors while leaving the women, the elderly, or children to take care of the farm work. Although this has not had a serious negative impact on agricultural production, it is potentially a serious problem, as it could inhibit further improvement in agricultural production.

Finally, the study finds that rural households view income from migration as transient income, since it has very small impact on rural consumption. This implies that rural people do not have a stable expectation about the returns from working in urban areas. The reluctance to give up farm land for no payment is one reason; the unwillingness of urban communi-

ties to grant the migrants permanent resident status and provide their children with equal educational opportunities is another. These institutions and policies have undoubtedly made urbanization in China a much slower process than it would otherwise have been.

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