Circular migration, or permanent stay? Evidence from China's rural–urban migration

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ABSTRACT

Although there is a rich literature on internal temporary migration in China, few existing studies deal with the permanent migration decision of China's rural labor. This paper will fill this gap and deal with the permanent migration choice made by rural migrants with the China General Social Survey (CGSS) data. Our results show that compared with their circular counterparts, permanent migrants tend to stay within the home provinces and are more likely to have stable jobs and earn high incomes and thus are more adapted to urban lives. We also find that more educated and more experienced migrants tend to be permanent urban residents, while the relationship of age and the probability of permanent migration is inverse U-shaped. Due to the restrictions of the current *hukou* system and the lack of rural land rental market, those people with more children and more land at home are more likely to migrate circularly rather than permanently.

1. Introduction

As the largest developing nation, China may have experienced the history's largest flow of internal migration in the world since the barriers on migration from rural to urban areas have been gradually removed in the late 1970s and early 1980s. With the development of urban food and labor markets and the rapid expansion of the urban and export-oriented sectors in eastern coastal regions, surplus rural labor out of the agriculture surge into cities in the hope of finding good job opportunities (Chan, 2001; Zhang & Song, 2003). The size of this migration flow has grown from less than 16 million in the 1980s to about 145 million in 2009 (Chan, 2001; National Bureau of Statistics of China, 2010). However, although rural people have been allowed to move freely between cities and their homes, most of them are only circular migrants and are still denied permanent urban residency rights and associated social benefits defined by the *hukou* system. The number of permanent migrants remains rather stable though temporary migrants continue to pour into cities since the 1980s (Chan, 2001; Chan & Buckingham, 2008; Yang, 2000).[1]

In comparison with that of other nations or regions acting as a statistical or recording system, China's *hukou* system was first introduced as a state institution to regulate or restrict population mobility during the planning period in the 1950s. Until the

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[1] The annual volume of permanent migrants with the change of *hukou* status ranged from 16 to 20 million in the 1980s and 1990s (Chan, 2001). Even after some reform measures including the easing of *hukou* transfer to small towns or cities were implemented since 1997, the official numbers show that only 1.39 million new *hukou* were issued in small towns or cities throughout the nation (Chan & Buckingham, 2008).

1990s, the classification of rural and urban *hukou* still determined the access to many benefits, such as grain rations, government-provided housing, employment, education and medical care. Those temporary migrants without urban *hukou*, even those who have stayed at the destination for years, are disadvantaged when compared to local urban residents or permanent migrants with urban *hukou* (Chan & Buckingham, 2008; Chan & Zhang, 1999; Deng & Gustafsson, 2006; Wang & Zuo, 1999; Zhang, 2010). Since the late 1990s, the authority for urban *hukou* admission has been handed over from the central government to local governments, and many cities have also taken measures to eliminate the distinction between rural and urban *hukou* within the individual city. However, local authorities usually grant the urban *hukou* only to those who are rich or well educated or to those who are immediate family members of existing urban citizens, and the equalization policy adopted by many urban governments only applies to those who have held local rural *hukou*.[2] Therefore, these reforms of the *hukou* system seem to be irrelevant for most of rural migrants from other regions, and even now *hukou* still plays an important role in deciding people's social benefits including medical treatment, social welfare, housing, children's education, etc., and remains an obstacle to rural migrants who live in cities (Chan & Buckingham, 2008; Chan & Zhang, 1999; Lu & Song, 2006; Zhang, 2010).

Although there is a growing body of literature (such as Hare, 1999; de Brauw & Rozelle, 2008; Lu & Song, 2006; Ma, 2001; Wang & Zuo, 1999; Zhao, 1999, 2002; Zhu, 2002) on China's internal migration in recent years, most migration studies in China exclusively focus on temporary migration, whereas hardly any studies examine permanent migration of China's rural labor.[3] Cai and Wang (2008) and Zhu and Chen (2010) have examined the intention of rural migrants to become permanent urban residents, based on the interviewees' answers to questions such as "Are you willing to give up rural land?" or "Are you willing to settle down in cities?". However, it may be almost impossible that the intention of permanent settlement expressed by the majority of rural migrants can be realized under China's current *hukou* system. Another study by Connelly, Roberts, and Zheng (2009) has investigated the determinants of permanent settlement in cities which is represented by the length of stay, or whether to reside with one's spouse or children in the same city with the 2001 Chinese Urban Labor Survey data. However, even if rural migrants have stayed in cities for a long time, few of them can be lucky enough to obtain a local urban *hukou* and most of them may still have to return home finally. Other studies (Deng & Gustafsson, 2006; Poston & Zhang, 2008; Yang, 2000) have examined the determinants of permanent migration decision accompanied with the change in *hukou* status, but they just studied the permanent decision made by the total population in general, not the decision made only by rural migrants. The possible reasons for the lack of studies on the permanent migration decision made by rural migrants in China may be: (1) the number of permanent migrants from rural areas with the change in *hukou* status is few due to the strict constraints imposed by the *hukou* system, and (2) it is difficult to obtain the survey data concerning permanent migrants.

This paper aims to fill this gap and deal with the permanent migration choice made by rural migrants with a unique nationally representative dataset, the China General Social Survey (CGSS) data. The survey contains plenty of information on characteristics of rural migrants, their family background, and their hometown. Most importantly, the positive answers to the questions "Have you obtained Lanyin *hukou* (Blue-stamp *hukou*) or urban *hukou* during your migration period?" and "Have you purchased housing in cities?" can help us to identify who are permanent migrants.[4] In comparison with other definitions mentioned above, our definition of "permanent migrant" is much closer to most of the existing migration literature on China (such as Cai, 2003; Chan & Buckingham, 2008; Wang, Oropesa, & Firebaugh, 2009; Yang, 2000) and may be of greater concern for policymakers.

Our results show that estimating the permanent migration decision with the simple probit model leads to the selection bias. After accounting for the selective nature of China's internal migration, we find that more educated and more experienced migrants tend to be permanent urban residents, while those people with more children and more land at home are more likely to migrate circularly rather than permanently. Our findings are robust to different definitions of "permanent migrant".

The reminder of the paper is structured as follows. The next section introduces the survey data, and outlines the characteristics of those permanent migrants, including information on their jobs and *hukou* status. Section 3 explains the empirical methodology to address the sample selection problem. The fourth section discusses the empirical results. The final section concludes.

2. Data

Our analysis is based on the 2006 Chinese General Social Survey (CGSS) conducted jointly by the Sociology Department of Renmin University of China and the Survey Research Centre of Hong Kong University of Science and Technology in September and October, 2006. This nationally representative survey adopted the four-phase stratified sampling method: county (district), town (street), village (neighborhood committee), and household. The samples of the former three phases were identified under the sampling framework of China's Fifth National Population Census and families were randomly selected with the identified villages or neighborhood committees.[5] After the identification of sampled households, then the interviewee is randomly selected among members aged above 18 who have

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[2] Although *hukou* restrictions in small towns and cities have been relaxed since the late 1990s, rural migrants are reluctant to apply for this kind of urban *hukou* since there are fewer job opportunities and less social benefits attached to *hukou* in small towns or cities and they have to give up their entitlement to land at home, representing a potential financial loss in some regions (Chan & Buckingham, 2008; Zhu & Chen, 2010).

[3] See Zhao (2007) for a detailed literature survey of China's temporary migration studies.

[4] Lanyin *hukou* is a semi-permanent local *hukou* which can be transferred into a permanent one under certain conditions. This kind of *hukou* is primarily granted to the three categories of migrants (investors, buyers of property, and skilled workers or professionals) based on their contributions to local cities (Chan & Buckingham, 2008; Chan & Zhang, 1999).

[5] The survey covered the same sampling locations, but the sampled households may not be the same. The survey was conducted annually from the year 2003 till 2008, and the latest available dataset is the 2006 wave. See The Department of Sociology of Renmin University of China (and the Survey Research Centre of Hong Kong University of Science and Technology (2006)) for more detailed description of the survey.

stayed or will stay in the household for more than one week. The survey contains detailed information on individual characteristics (e.g., gender, age, education, occupation), household characteristics (e.g., family size, number of children, land, housing), and community characteristics (e.g. location, communication conditions, related economic indicators).[6] In addition, a migration module is included to provide detailed information on the migration histories of all household members.[7] In total, the survey covered 10,151 households in 28 provinces, municipalities, and autonomous regions, including 6013 urban households and 4138 rural households. We draw on the rural household samples in our study, which covered 24 provinces, municipalities, and autonomous regions.

We define "rural labor" as those people aged between 15 and 64 with rural *hukou*, excluding those at-school family members and those people with the education level of bachelor degree and above. In order to study the behavior of those permanent migrants, we also include in "rural labor" those who have obtained their Lanyin *hukou* (Blue-stamp *hukou*) or urban *hukou* during their stay in cities. In terms of people's responses to questions "Is there any migrant in your family" and "Who are migrants in your family", we identify those rural laborers with the positive answers as rural migrants. In addition, accounting for the fact that China's temporary migrants tend to move circularly between their hometowns and destinations, we include in "rural migrants" those people who stayed at home when interviewed, but have migrated before and responded with yes answers to the question "Are you planning to remigrate within this year". Altogether, we get 13,404 rural labor samples and 2274 rural migrants.

Although the migration status in most countries is identified in terms of the length of time of staying in destinations, China's permanent migrants are usually defined as those people who have obtained Lanyin *hukou* (Blue-stamp *hukou*) or formal urban *hukou* (Cai, 2003; Chan & Buckingham, 2008; Wang et al., 2009; Yang, 2000; Zhang, 2010). Taking into account the fact that those people who have purchased houses in cities may not return home to engage in agricultural activities and spend most of their time in cities, we also include them in "permanent migrants". Actually, migrants make their housing decisions based on whether they intend to stay in cities or have the hope of obtaining Lanyin *hukou* (Blue-stamp *hukou*) or formal urban *hukou* in the near future. In addition, those fortunate few migrants who have purchased housing in cities are likely to be older, better educated, long-term migrants with higher income (Wu, 2004). Therefore, in terms of positive responses to questions "Have you obtained Lanyin *hukou* (Blue-stamp *hukou*) or formal urban *hukou* during your migration period" and "Have you purchased housing in cities", we finally get 182 permanent migrants and 2092 circular migrants.[8] The characteristics of all categories of rural laborers are shown in Table 1.

Consistent with the results of other similar studies (Hare, 1999; Zhao, 1999), rural migrants tend to be male, young, unmarried and more educated. Among those rural migrants, about three quarters have received the education of junior middle school and above. The migrant households have more labor resources but less land, with the average of 4.48 laborers, 2.89 *mu* of dry land and 1.89 *mu* of irrigated land. In addition, the villages where migrant households live are more likely to be far away from county seats and from townships, the numbers of collectively-owned enterprises or private enterprises in villages are fewer and the ratios of local off-farm net income to the total net income are lower. All these facts indicate that the "push" force due to the lack of local off-farm job opportunities makes rural labor more inclined to migrate to cities (Hare, 1999; Zhao, 1999).

Compared with circular migrants, permanent migrants tend to be older, more likely to be married, and more educated. Only about 10% of permanent migrants receive the education of elementary school and below, while 40% of them have the education of senior middle school and above, approximately 30 percentage points higher than that of circular migrants. The proportion of permanent migrants as party members is also much higher than that of circular migrants, and the year of first migration for permanent migrants is also much earlier. The fact that permanent migrants are more experienced and educated may indicate they are better prepared for surviving in cities than their circular counterparts (Deng & Gustafsson, 2006). Compared with circular migrants, permanent migrants are more likely to move within the home province (Cai & Wang, 2008; Yang, 2000), with the proportions of inter-provincial migration being 35.16% and 54.68% for permanent and circular migrants, respectively. This may reflect that permanent migrants are more likely to settle down in small urban centers near home due to relatively lower financial or psychological costs, while their hope of obtaining an urban *hukou* or buying housing in large cities, especially across provinces, are very slim (Cai & Wang, 2008; Chan & Buckingham, 2008).

In addition, the labor resources of those permanent migrant households with are much richer than the households with circular migrants, with the average of 5.15 laborers for the former and 4.42 for the latter. As one indicator measuring household wealth, the average house value of the households with permanent migrants more than doubles that of the household with circular migrants.[9]

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[6] Because the 2006 wave of CGSS does not contain information on the community characteristics, we can turn to the 2005 wave, which includes a community-level questionnaire covering the location, population, infrastructure, and general economic conditions of the same administrative villages in 2004.

[7] Unfortunately, the documented survey description does not provide the definition of "household". Therefore, if those nuclear families which include only young couples and their children migrate to cities without any member left in rural areas, they may not be covered in the survey. However, the randomly chosen interviewees are required to report not only the migration history of themselves and their spouses, but also that of their parents, their children and the spouses of their children if they have. Therefore, the underestimation problem of permanent migrants may be not serious.

[8] According to NBS (2010), the rural migrants going with the family was about 20 percent of the total migrants in 2009. However, the definition of "family migration" may not refer to the families without any member left in rural areas. Usually, family migration in China refers to both husbands and wives migrating together according to the literature (such as Yuan & Zhao, 2007; Zhou, 2004). Actually, many rural migrants go with their spouses but leave their children at home cared by their old parents due to the schooling restrictions in cities. As mentioned by de Brauw and Giles (2008), both the current *hukou* system and the land tenure system make the migration of entire families without members left in rural areas almost impossible. Furthermore, these migrants who are labeled as migrants going with the family may have already been covered in the CGSS survey according to the survey procedure. The randomly chosen interviewees are required to report not only the migration history of themselves and their spouses, but also that of their parents, their children and the spouses of their children if they have. Therefore, although the magnitude of permanent migrants from rural areas may be underestimated in our paper, the problem may not be serious.

[9] In rural China, the house may be the most valuable fixed assets for households. According to McKinley and Wang (1992), the house value accounts for nearly one third of rural wealth. Actually, rural people in China prefer to invest their money in building houses to show their wealth status or to prepare for boys' marriage (de Brauw & Rozelle, 2008).

Table 1
Characteristics of rural laborers.

	All rural labor	Rural migrant	Non-migrant	Permanent migrant	Circular migrant
Individual					
Male (%)	50.60	64.73	47.71	64.29	64.77
Age (in years)	38.81	29.09	40.80	31.42	28.88
Married (%)	84.06	61.35	88.70	72.53	60.37
Education					
Illiterate and semi-illiterate (%)	14.46	2.33	16.94	0.55	2.49
Elementary school (%)	33.77	23.79	35.80	9.89	25.00
Junior middle school (%)	42.64	59.98	39.09	50.00	60.85
Senior middle school (%)	4.79	7.17	4.30	8.79	7.03
Vocational school (%)	3.60	5.01	3.32	22.53	3.49
College (%)	0.75	1.72	0.55	8.24	1.15
Party membership (%)	3.39	2.46	3.58	9.34	1.86
Year of the first migration		1999.85		1996.88	2000.10
Inter-provincial migration (%)		53.12		35.16	54.68
Household					
Size	5.74	6.01	5.69	6.87	5.94
Number of children less than 6 years old	0.42	0.46	0.42	0.45	0.46
Number of at-school children	0.67	0.67	0.67	0.65	0.68
Number of old people above 65 years old	0.43	0.40	0.44	0.62	0.38
Number of laborers	4.22	4.48	4.17	5.15	4.42
Dry land (in *mu*)	4.03	2.89	4.26	2.43	2.93
Irrigated land (in *mu*)	1.92	1.89	1.93	2.05	1.88
House size (in square meters)	119.38	122.44	118.76	138.02	121.07
House value (in 10 thousand yuan)	3.49	3.02	3.58	5.67	2.80
Community					
Distance from county seat (in km)	29.91	31.86	29.51	27.82	32.22
Distance from township (in km)	5.93	6.39	5.84	5.62	6.46
Number of collectively-owned enterprises	0.34	0.29	0.35	0.42	0.27
Number of private enterprises	2.75	2.47	2.81	3.81	2.35
Per capita net income (in yuan)	1869.69	1698.36	1904.36	2203.07	1652.53
Ratio of agricultural income (%)	49.91	46.90	50.52	43.18	47.25
Ratio of local off-farm income (%)	17.58	15.11	18.08	22.62	14.42
Ratio of migrant remittances (%)	23.74	29.33	22.61	23.86	29.83
Number of observations	13404	2274	11130	182	2092

Source: CGSS.

The vocations of permanent and circular migrants are also sharply different. As indicated by Table 2, the proportions of "entrepreneur" and "professional and technical personnel" of permanent migrants are 16.20% and 10.56% respectively, much higher than those of circular migrants. People were also inquired about their employment statuses in the recent three months. The responses show that the ratios of full employment for permanent and circular migrants are 79.12% and 62.81% respectively, while those of part-time or temporary employment are 15.94% and 29.4% (see Table 3). As a whole, compared with their circular counterparts, permanent migrants are more likely to have stable jobs, earn high incomes and thus more adapted to urban lives (Zhang, 2010).

Although the *hukou* system has become less restrictive nowadays, there are still few routes for rural migrants to obtain the urban *hukou*. The possible ways of procuring an urban *hukou* for rural people are mostly limited to: (1) being enrolled in colleges or universities, (2) being granted urban *hukou* for those who are demobilized to cities after serving in the army, (3) being granted local urban *hukou* for those displaced due to land expropriation, (4) reuniting with immediate family members who have held an urban *hukou*, (5) being rewarded an urban *hukou* by buying housing or make other investments in cities, and (6) buying an urban *hukou* directly from some local governments which need money to meet financial ends (Chan & Buckingham, 2008; Deng & Gustafsson, 2006). However, the mentioned-above ways of obtaining an urban *hukou* seem to be impossible for the great majority of rural migrants since they have few opportunities of being admitted to universities or the army, don't have much contact with cities before their migration, and usually cannot afford to buy urban *hukou* or invest in cities.

As shown by Table 4, less than one half of permanent migrants have procured the formal urban *hukou*, and about one quarter of permanent migrants who have purchased housing in cities still don't have the urban *hukou*. However, even for those who have procured the formal urban *hukou* during their migration period, most of them can only obtain the urban *hukou* of small and medium-sized cities, and the restrictions on obtaining the urban *hukou* of large cities are still tight. Among those people with the formal urban *hukou* only less than 20% have obtained the *hukou* of prefecture-level or provincial capital cities, and even no rural migrants in our sample can get the *hukou* of municipalities. This finding is consistent with other similar studies. As Chan and Buckingham (2008) have pointed out, large cities where more public benefits are available still tend to stipulate the most stringent entry conditions even now, while small towns or cities with almost no social benefits have the lowest entry threshold. Therefore, rural migrants are more likely to obtain local urban *hukou* in small towns or cities rather than in large cities.

Table 2
Percentages of migrants with different vocations (%).

Type	All migrants	Permanent migrants	Circular migrants
Entrepreneur	5.78	16.20	4.98
Professional and technical personnel	2.06	10.56	1.41
Clerk and related workers	5.98	10.56	5.63
Business service personnel	12.47	11.27	12.56
Agriculture and water conservancy labors	1.81	2.11	1.79
Production, transport equipment operators and related workers	67.52	44.37	69.30
Others	4.37	4.93	4.33
Total	100	100	100

Source: CGSS.

3. Empirical methodology

Our primary interest lies in why rural labor chooses to migrate permanently rather than circularly. Therefore, we can employ a simple probit model to estimate the determinants of permanent migration decision of rural migrants:

$$Y_1^* = X_1'\beta_1 + \varepsilon_1 \text{ with } Y_1 = 1 \text{ if } Y_1^* > 0, \text{ and } Y_1 = 0 \text{ otherwise} \tag{1}$$

where Y_1 is a dummy variable for permanent migration choice.

However, one problem when estimating the permanent migration decision of rural migrants is that they may not be a random sample from the total population. The selection problem might occur due to the fact that the characteristics of rural migrants might differ from those of non-migrants because migration decision can be a self-selection process with respect to some unobservable characteristics (e.g., lower risk aversion). Therefore, estimating the permanent migration choice only with the migrant samples can lead to a selection bias problem (Greene, 2002).

To address this problem, we use the Van de Ven and Van Praag (1981) probit application of the Heckman (1979) selection bias correction procedure. The procedure is very similar to the Heckman selection model, except that the dependent variable in the outcome equation is also binary. So, we should introduce another selection equation of whether rural laborers choose to migrate:

$$Y_2^* = X_2'\beta_2 + \varepsilon_2 \text{ with } Y_2 = 1 \text{ if } Y_2^* > 0, \text{ and } Y_2 = 0 \text{ otherwise} \tag{2}$$

where Y_2 is a dummy variable for migration decision.

We can observe Y_1 only when $Y_2 = 1$. The assumptions about the above two error terms are: $E(\varepsilon_1|X_1,X_2) = E(\varepsilon_2|X_1,X_2) = 0$, $Var(\varepsilon_1|X_1,X_2) = Var(\varepsilon_2|X_1,X_2) = 1$, and $Cov(\varepsilon_1,\varepsilon_2|X_1,X_2) = \rho$ (Greene, 2002). We can fit the first probit model with sample selection with the two-step procedure (Greene, 2006).[10] If there is no possibility for correlation between the errors in Eqs. (1) and (2), then ρ will be zero and the selection bias is not a concern. In that case, the standard probit technique applied to the first equation is appropriate.

Similar to other studies (Cai & Wang, 2008; Deng & Gustafsson, 2006), we include two categories of explanatory variables (X_1) in the permanent migration decision equation (Eq. (1)): individual characteristics of rural labors and their household features. Although the identification of the probit model can be theoretically achieved due to its nonlinear nature, we also include some exogenous variables as instruments in the migration decision selection equation (Eq. (2)) to improve the identification.

Following most migration decision studies (such as Hare, 1999; Ma, 2001; Zhao, 1999), we choose the variables concerning the economic development level of origin communities as selection instruments: distance between the village and the township, distance between the village and the county seat, and ratio of average local off-farm income to average net income of the village two years prior to the year of survey. We believe that those villages which are not economically active themselves and are far from local economic centers are not attractive to rural labors compared with cities, and thus exert "push" effects on rural labor migration decision. It's expected that these three variables are jointly significant in explaining the tendency to migrate out. On the other hand, whether one can become a permanent urban resident or not may be more related to individual or household characteristics (such as individual education level, household wealth), or factors with respect to destination regions (such as the *hukou*-related policies stipulated by urban authorities of destination regions). The economic development level of origin communities may not have direct impacts on the permanent migration decision of rural migrants, and thus those instrument variables concerning origin communities can be exogenous to people's permanent migration decision.

The individual characteristics of rural laborers include their demographic features and migration experiences. In general, those rural migrants are likely to be unmarried, male and more educated compared with their non-migrating counterparts in rural areas (Hare, 1999; Zhao, 1999). Because males can usually earn more money, they are expected to be more likely to stay in cities permanently. After controlling for other individual characteristics, more educated migrants are expected to be more inclined to migrate permanently. In addition, after staying in cities for a long time, rural migrants can accumulate more wealth and human capital, and thus are more likely to be permanent migrants (Deng & Gustafsson, 2006). Due to lack of detailed information on their

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[10] For technical details, please refer to Greene (2006). We can employ the Stata command "heckprob" to fulfill the task.

Table 3
Employment statuses of rural migrants (%).

Employment status	All migrants	Permanent migrants	Circular migrants
Never employed	0.48	0.00	0.53
Full employment	64.12	79.12	62.81
Part-time employment	2.95	1.10	3.11
Temporary employment	25.37	14.84	26.29
Others	7.08	4.95	7.27
Total	100	100	100

Source: CGSS.

migration histories, we define four dummy variables for their migration experiences in terms of the beginning year of the first migration: less than 3 years, 4 to 6 years, 7 to 10 years, and more than 11 years.[11]

Like most similar studies, we regard out-migrants as rural household members. Therefore, after controlling for the number of dependents in the family, the large household size means rich labor resources and thus household members are more likely to look for job opportunities in cities and to become permanent migrants. The at-school children include both the children aged between seven and fourteen and those children who are aged above fifteen but still stay at school. The large number of dependents left behind at home can exert negative impacts on the probability of both rural labor migration and permanent migration. After controlling for other household characteristics, the land can also have negative impacts on people's inclination to migrate out or migrate permanently.

4. Results

The empirical results of the simple probit model and the probit model with selection are shown in Tables 5 and 6, respectively. We find that the correlation coefficient between the error terms of Eqs. (1) and (2) is 0.8508, which is significant at the 1% level. Furthermore, if we compare the results of the simple probit model and the probit model with selection, we can easily find that the signs and the significance levels of several independent variables are different. Therefore, it is evident that estimating the permanent migration decision with the simple probit model leads to the selection bias. Next, the empirical results explained below are restricted to the probit model with selection.

As the second column of Table 6 indicates, those unmarried, young, male and more educated rural laborers are more inclined to migrate to cities, reflecting the selective nature of China's rural–urban migration documented in most China's migration studies (Hare, 1999; Zhao, 1999, 2007; Zhu, 2002). Those people whose families are endowed with abundant labor resources are more likely to move to cities to look for job opportunities. However, those rural laborers whose families are burdened with more elderly people and more land tend to stay at home, while those people with more at-school children are more likely to migrate. The possible explanations are that educational expenditures are the main burden for rural households and rural laborers have to seek more rewarded job opportunities in cities rather than in rural areas.

The selection instruments regarding the economic development level of source communities are all statistically significant and have the expected signs: the distances from the county seat and from the township positively affect the probability of being a migrant, while the ratio of local off-farm income to the total net income exerts a negative impact.[12]

We include the explanatory variable "age squared (divided by 100)" in the permanent migration equation to account for possible life-cycle effects. In contrast to the simple probit model results in Table 5, the results in Table 6 reveal that the relationship of age and the probability of permanent migration is inverse U-shaped. That is, those young or middle-aged laborers are more likely to be permanent migrants. The possible explanations may be that those rural migrants who are too young or too old can hardly accumulate enough wealth in cities and thus are less likely to obtain a formal urban *hukou* or purchase urban housing. Consistent with other studies (Cai & Wang, 2008; Zhu & Chen, 2010), the education level has a statistically significant and positive impact on the possibility of becoming permanent urban residents. Even after controlling for their demographic characteristics, those people with more migration experiences are more likely to be permanent urban residents. However, it's inconsistent with our expectation that the impact of gender on people's tendency to become permanent migrants is not statistically significant. The possible explanation may lie in the fact that female migrants are easier to marry local urban residents and thus they can gain more opportunities to become permanent migrants (Deng & Gustafsson, 2006).

Consistent with our expectation, those people with few labor resources and more dependents left behind at home tend to migrate circularly rather than permanently. Due to the restrictions of the current *hukou* system and relatively high living or educational costs in cities, it's difficult for rural migrants to bring their children to cities to live and receive education (Connelly et al., 2009). Another special feature in the case of rural China is the land allocation system which imposes a high cost on people's permanent migration, which is the potential loss of land without any compensation (Chan & Buckingham, 2008; Snyder & Chern, 2009). Therefore, those rural migrants whose families have more dry land are less likely to be permanent urban residents. Cai and Wang (2008) also report similar results.

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[11] We calculate "migration experience" as 2006 minus the beginning year of the first migration. But some people may choose to stay at home villages for some time during this period, which can lead to the overestimate of the migration experience. Therefore, we define four dummy variables for different migration intervals, which may somewhat alleviate the problem.

[12] We have also included only any two of the above three variables as instruments in the model and it's found that the coefficients on the key variables of interest change little. This may lend support to our arguments on the exogeneity of the instruments. The results are available upon request.

Table 4
Hukou status of permanent migrants.

Hukou status	Number of samples	Percentage
Lanyin *hukou*	61	33.52
Formal urban *hukou*	75	41.21
Small town	37	20.33
County seat	23	12.64
Prefecture-level city	13	7.14
Provincial capital	2	1.10
No blue-cover or formal urban *hukou*	46	25.27
Total	182	100.00

Source: CGSS.

As we mentioned in the second section, permanent migrants are defined as those who have obtained Blue-stamp *hukou* or formal urban *hukou* or those who have purchased housing in cities, while China's permanent migrant status is usually defined only in terms of *hukou* status in most migration studies (Wang et al., 2009; Yang, 2000). That is to say, those migrants who have purchased housing in cities may not as "permanent" as those migrants who have obtained urban *hukou*. Therefore, next we will redefine permanent migrants as those people who have obtained their urban *hukou* during their migration period to examine the permanent migration tendency of China's rural migrants, as shown by Table A1 in the appendix. Also, considering those rural migrants who have stayed in cities for a long time may have little contact with their hometowns in rural areas (Connelly et al., 2009), we redefine "permanent migrants" as those people who have obtained local Lanyin or official urban *hukou*, or have bought housing in cities, or have stayed in cities for more than ten years. The empirical results regarding this definition are shown in Table A2. Finally, we exclude in "circular migrants" those who planned to remigrate within the year but stayed at home when interviewed, while the definition of "permanent migrants" are the same as in the second section. The results are shown in Table A3. As the empirical results in the appendix exhibit, the correlation coefficients between the two error terms are all still significant at the 5% level, indicating the possible bias of the estimation with the simple probit model. The coefficients of most explanatory variables are very similar to the results in Table 6, except for several variables for individual characteristics.[13]

To sum up, the sample selection problem leads to the biased estimates of the simple probit model. The results of the probit model with selection show that more educated and more experienced migrants tend to be permanent urban residents, while the relationship of age and the probability of permanent migration is inverse U-shaped. Due to the restrictions of the current *hukou* system and the lack of rural land rental market, those people with more children and more land at home are more likely to migrate circularly rather than permanently. Our results are robust to different definitions of "permanent migrant".

5. Conclusions

With the acceleration of China's urbanization process, more rural migrants are seeking opportunities to become permanent urban residents. However, although there is a rich literature on temporary migration in China, few existing studies deal with the permanent migration decision of China's rural labor. This paper fills this gap and deal with the permanent migration choice made by rural migrants with the China General Social Survey (CGSS) data. Considering the sample selection problem, we use the two-stage method proposed by Van de Ven and Van Praag (1981) to estimate the impacts of people's individual and household characteristics on the probability of being permanent migrants. Our regression results are robust to different definitions of "permanent migrant".

Compared with their circular counterparts, permanent migrants tend to stay within the home provinces and are more likely to have stable jobs and earn high incomes and thus are more adapted to urban lives. However, even for those who have procured the formal urban *hukou* during their migration period, most of them can only obtain the urban *hukou* of small and medium-sized cities, and the restrictions on obtaining the urban *hukou* of large cities are still tight. Among those people with the formal urban *hukou* less than 20% have obtained the *hukou* of prefecture-level or provincial capital cities, and even no rural migrants can get the *hukou* of municipalities.

Our results also show that those more educated and more experienced migrants tend to be permanent urban residents, while the relationship of age and the probability of permanent migration is inverse U-shaped. As the possible ways of procuring an urban *hukou* are only limited to those rural migrants with more accumulated wealth and human capital, those less educated or experienced migrants can hardly afford to purchase urban housing or get the urban *hukou*.

In addition, those people with more children and more land at home are more likely to migrate circularly rather than permanently. Due to the restrictions of the current *hukou* system and relatively high living or educational costs in cities, it's difficult for rural migrants to bring their children to cities to live and accept education. Also, the lack of rural land rental market exerts negative impacts on migrants' decision to stay in cities permanently.

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[13] We also have done other sensitivity analysis with the combination of different definitions of "circular migrants" and "permanent migrants", and obtained similar results. These results are available upon request.

Table 5
Estimation results of the simple probit model.

Explanatory variables	Dependent variable: permanent migration decision ($Y_1 = 1$)
Individual characteristics	
Male	−0.148(0.094)
Age	0.06(0.038)
Age square/100	−0.062(0.051)
Married	−0.054(0.134)
Education (reference group: illiterate or semi-illiterate)	
Junior middle school	0.473(0.126)***
Senior middle school	0.59(0.179)***
Vocational school	1.728(0.174)***
College	1.751(0.241)***
Migration experience (reference group: less than 3 years)	
4 to 6 years	0.166(0.132)
7 to 10 years	0.46(0.143)***
More than 11 years	0.668(0.131)***
Household characteristics	
Size	0.124(0.027)***
Number of children aged below 6	−0.154(0.058)***
Number of at-school children	−0.196(0.052)***
Number of old people aged above 65	0.011(0.051)
Dry land	−0.003(0.01)
Irrigated land	−0.001(0.015)
Constant	−3.884(0.64)***
Log pseudolikelihood	−514.9401
Pseudo R^2	0.1878
Observations	2274

Note: ① Standard deviations are in parentheses. ② *** significant at 1%, ** significant at 5%, * significant at 10%. ③ All results are robust variance estimates.

Table 6
Results of the probit model with selection.

Explanatory variables	Permanent migration decision ($Y_1 = 1$)	Migration decision ($Y_2 = 1$)
Individual characteristics		
Male	0.114(0.076)	0.436(0.03)***
Age	0.058(0.03)*	0.011(0.011)
Age square/100	−0.094(0.041)**	−0.069(0.014)***
Married	−0.206(0.114)*	−0.377(0.051)***
Education (reference group: illiterate or semi-illiterate)		
Junior middle school	0.471(0.099)***	0.188(0.034)***
Senior middle school	0.614(0.142)***	0.275(0.066)***
Vocational school	1.437(0.147)***	0.207(0.073)***
College	1.566(0.199)***	0.589(0.148)***
Migration experience (reference group: less than 3 years)		
4 to 6 years	0.123(0.106)	
7 to 10 years	0.366(0.115)***	
More than 11 years	0.482(0.102)***	
Household characteristics		
Size	0.121(0.022)***	0.054(0.008)***
Number of children aged below 6	−0.11(0.047)**	0.016(0.019)
Number of at-school children	−0.115(0.044)***	0.032(0.018)*
Number of old people aged above 65	−0.03(0.041)	−0.063(0.019)***
Dry land	−0.015(0.008)**	−0.023(0.004)***
Irrigated land	−0.006(0.012)	−0.008(0.003)***
Community characteristics		
Distance from county seat		0.001(0.001)**
Distance from township		0.008(0.003)***
Ratio of local off-farm income to the total net income		−0.005(0.001)***
Constant	−4.07(0.514)***	−0.712(0.181)***
Log pseudolikelihood	−5162.419	
Correlation coefficient of error terms	$\rho = 0.8508$	
Wald test of independent equations	chi2(1) = 27.95 Prob > chi2 = 0.0000	
Observations	2146	12,780

Note: ① Standard deviations are in parentheses. ② *** significant at 1%, ** significant at 5%, * significant at 10%. ③ All results are robust variance estimates.

Those findings have important policy implications. Although the *hukou* system has become less restrictive nowadays, it is still attached with many benefits which are inaccessible to rural migrants without the urban *hukou*. For example, the children of circular migrants are not permitted to attend the college entrance examination in destination regions due to the lack of local urban *hukou* even if they have received education in cities since they were born. As indicated by our results, only a small fraction of rural people endowed with more wealth or better human capital can become permanent urban residents by the few routes such as purchasing housing in cities or directly buying the urban *hukou*. Most rural migrants belong to urban population only in a statistical sense, and they have to frequently move between their hometowns and urban destinations. Therefore, although China's urbanization level has been improved significantly in recent years and is expected to grow continuously in the future, the potential gains from urbanization would not be fully realized without integrating most rural migrants into urban lives. In light of the current limited capacity of urban centers to provide enough public goods and services for all rural migrants, the *hukou* system reform may be a gradual and long-term process. But the first step should be taken to gradually nullify the privileged welfares attached to the urban *hukou*, such as employment, education, health and social security.

Acknowledgements

Appendix A. Robustness check results

Table A1
Results with permanent migrants excluding those buying housing in cities.

Explanatory variables	Permanent migration decision ($Y_1 = 1$)	Migration decision ($Y_2 = 1$)
Individual characteristics		
Male	0.108(0.1)	0.436(0.03)***
Age	0.033(0.034)	0.011(0.011)
Age square/100	−0.056(0.046)	−0.069(0.014)***
Married	−0.008(0.127)	−0.381(0.051)***
Education (reference group: illiterate or semi-illiterate)		
Junior middle school	0.543(0.12)***	0.189(0.034)***
Senior middle school	0.489(0.183)***	0.276(0.066)***
Vocational school	1.526(0.196)***	0.206(0.073)***
College	1.726(0.234)***	0.589(0.149)***
Migration experience (reference group: less than 3 years)		
4 to 6 years	0.077(0.121)	
7 to 10 years	0.256(0.127)**	
More than 11 years	0.293(0.12)**	
Household characteristics		
Size	0.104(0.027)***	0.054(0.008)***
Number of children aged below 6	−0.14(0.058)**	0.016(0.02)
Number of at-school children	−0.141(0.054)***	0.032(0.018)*
Number of old people aged above 65	−0.007(0.048)	−0.065(0.019)***
Dry land	−0.025(0.015)*	−0.023(0.004)***
Irrigated land	−0.011(0.015)	−0.008(0.003)**
Community characteristics		
Distance from county seat		0.001(0.001)*
Distance from township		0.008(0.003)***
Ratio of local off-farm income to the total net income		−0.005(0.001)***
Constant	−3.746(0.579)***	−0.718(0.181)***
Log pseudolikelihood	−5078.585	
Correlation coefficient of error terms	$\rho = 0.6985$	
Wald test of independent equations	chi2(1) = 4.53 Prob>chi2 = 0.0333	
Observations	2146	12,780

Note: ① Standard deviations are in parentheses. ② *** significant at 1%, ** significant at 5%, * significant at 10%. ③ All results are robust variance estimates.

Table A2
Results with permanent migrants including those who have stayed in cities for over ten years.

Explanatory variables	Permanent migration decision ($Y_1 = 1$)	Migration decision ($Y_2 = 1$)
Individual characteristics		
Male	0.16(0.088)*	0.436(0.03)***
Age	0.125(0.045)***	0.011(0.011)
Age square/100	−0.206(0.066)***	−0.068(0.014)***
Married	−0.124(0.119)	−0.379(0.051)***
Education (reference group: illiterate or semi-illiterate)		
Junior middle school	0.4(0.128)***	0.189(0.034)***
Senior middle school	0.484(0.184)***	0.276(0.066)***
Vocational school	1.264(0.17)***	0.206(0.072)***
College	1.368(0.224)***	0.594(0.149)***
Migration experience (reference group: less than 3 years)		
4 to 6 years	0.06(0.106)	
7 to 10 years	0.289(0.112)***	
More than 11 years	5.595(0.643)***	
Household characteristics		
Size	0.108(0.028)***	0.054(0.008)***
Number of children aged below 6	−0.202(0.071)***	0.017(0.02)
Number of at-school children	−0.216(0.058)***	0.032(0.018)*
Number of old people aged above 65	0.028(0.049)	−0.065(0.019)***
Dry land	−0.01(0.005)*	−0.023(0.004)***
Irrigated land	0.006(0.009)	−0.008(0.003)***
Community characteristics		
Distance from county seat		0.002(0.001)**
Distance from township		0.008(0.003)***
Ratio of local off-farm income to the total net income		−0.005(0.001)***
Constant	−4.871(0.712)***	−0.725(0.182)***
Log pseudolikelihood	−5005.961	
Correlation coefficient of error terms	$\rho = 0.8814$	
Wald test of independent equations	chi2(1) = 15.62 Prob>chi2 = 0.0001	
Observations	2146	12,780

Note: ① Standard deviations are in parentheses. ② *** significant at 1%, ** significant at 5%, * significant at 10%. ③ All results are robust variance estimates.

Table A3
Results with circular migrants excluding those who were planning to remigrate within the year but stayed at home when interviewed.

Explanatory variables	Permanent migration decision ($Y_1 = 1$)	Migration decision ($Y_2 = 1$)
Individual characteristics		
Male	0.132(0.072)*	0.361(0.031)***
Age	0.053(0.027)*	0.014(0.011)
Age square/100	−0.088(0.036)**	−0.072(0.015)***
Married	−0.224(0.114)**	−0.381(0.052)***
Education (reference group: illiterate or semi-illiterate)		
Junior middle school	0.467(0.095)***	0.22(0.036)***
Senior middle school	0.599(0.138)***	0.295(0.069)***
Vocational school	1.392(0.156)***	0.241(0.074)***
College	1.508(0.184)***	0.544(0.142)***
Migration experience (reference group: less than 3 years)		
4 to 6 years	0.116(0.103)	
7 to 10 years	0.338(0.11)***	
More than 11 years	0.471(0.097)***	
Household characteristics		
Size	0.112(0.022)***	0.06(0.008)***
Number of children aged below 6	−0.102(0.044)**	0.005(0.021)
Number of at-school children	−0.102(0.042)**	0.021(0.019)
Number of old people aged above 65	−0.034(0.039)	−0.049(0.02)**
Dry land	−0.013(0.006)**	−0.022(0.004)***
Irrigated land	−0.007(0.012)	−0.006(0.003)**
Community characteristics		
Distance from county seat		0.002(0.001)**
Distance from township		0.006(0.003)**
Ratio of local off-farm income to the total net income		−0.006(0.001)***
Constant	−3.96(0.472)***	−0.87(0.189)***
Log pseudolikelihood	−4788.939	
Correlation coefficient of error terms	$\rho = 0.9524$	
Wald test of independent equations	chi2(1) = 7.84 Prob>chi2 = 0.0051	
Observations	1870	12,801

Note: ① Standard deviations are in parentheses. ② *** significant at 1%, ** significant at 5%, * significant at 10%. ③ All results are robust variance estimates.

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