On the Rural Economy of China: How do Rural-Urban Migration and Rural Non-farm Business Affect Each Other?

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Abstract

Since the 1980s, China has actively pursued strategies to increase rural-urban labor mobility and to encourage the development of rural non-farm industries. As a direct result, rural individuals began to seek employment opportunities outside of farm sector. They faced two primary options: working in urban sectors as migrant workers, and working in rural non-farm business. The focus of this paper is on the relationship between the two occupational choices. This paper uses household survey data from ten provinces in China, for the period 1995-1999. The results reveal two layers of relationship between outward migration and rural non-farm business. The first (or direct) effect indicates that, households with migrant family members are less likely to be in non-farm business. This relationship is caused by time and labor constraints facing rural households. The second (or indirect) effect indicates that, households with migrant family members are more likely to be in non-farm business. This relationship is caused by unobserved characteristics which impact the probability of migrating and starting business in the same direction. Such unobserved characteristics include migrant network in urban areas, entrepreneurial skills and risk attitude. The two effects exist at the same time, though via different channels. Furthermore, better education, larger family size, and a higher proportion of male family members increase the likelihood of both migrating and starting business.

Keywords: China, rural-urban migration, non-farm business

JEL - codes: C33, C35, J61

1. Introduction

Most countries in the developed world had gone through industrialization and urbanization. In 2010, 75% of residents in more developed countries lived in cities, more about half (54%) of less developed country residents lived in rural areas, and 72% of the least developed country residents lived in rural areas (Population Reference Bureau, 2011). Industrialization and urbanization have been perceived as the key to development, especially in populous developing countries. China's development since its economic reform in 1978 provides an interesting case here. In 1978, about 83% of Chinese lived and worked in rural agricultural sector. Since then, the government has actively pursued strategies to encourage rural people to work outside of the agricultural sector. The two off-farm occupational choices facing rural households—migrationand working in non-farm business—areessential to China's demographic and economic structure. The focus of this paper will be on the relationship between rural-urban migration and rural non-farm business. In other words, how do rural households make choices between migration and non-farm business? If some family members are migrant workers in cities, are the rest of them who stay in hometown more or less likely to be in non-farm business? If a household is in non-farm business, are they more or less likely to send some family members to work in urban areas? Additionally, this paper will also reflect on other important factors such as education and gender, which influence migration and non-farm business participation.

From 1958 until the dawn of the reform, the Household Registration system (the *Hukou* system) officially categorized all citizens into those holding "non-agricultural household registrations" and those holding "agricultural household registrations". In addition, the government imposed rations on daily commodities, controlling food stamps (*Liangpiao*), oil stamps (*Youpiao*), cloth stamps (*Bupiao*), etc. Commodity stamps were distributed to urban residents according to locations of household registration, family sizes and other factors.

The combination of the Household Registration system and commodity rationing created an effective barrier to labor mobility, especially labor relocations from rural to urban areas. Urbanization rate was extremely low in China, only 17% in 1978. Since then, a series of policy changes in the Household Registration system have taken place to gradually allow rural individuals to work in cities. Consequently, the number of migrant workers increased from less than 2 million in early 1980s, to 30 million in 1989, to 120 million in 2004 (Research Team in the State Council of China, 2006). The total number of migrant workers was estimated to be 140.41 million on December 31, 2008 (NBSC, 2009). As more and more rural labor flew into urban areas in the 1980s and 1990s, issues related with overurbanization (rising crime rate, high urban unemployment rate, overburdened public services, etc.) became increasingly severe. The increasing inflows of rural migrant workers to urban centers raised another challenge: how to resolve the overurbanization issue while allowing rural labor to work off-farm? The policy response to this challenge, as summarized by NBSC (1999a, 1999b), was to develop rural industries to create more employment opportunities, help absorb rural labor surplus, and ultimately transform rural regions to a densely populated "urbanized countryside" (*Chen Zhen Hua*). As a result, employment in rural non-farm business expanded from 9.163 million in 1980 to 165.363 million in 2002, and the share of rural non-farm sectors in total rural employment rose from 2.98% in 1980 to 34.08% in 2002 (NBSC, 2003). More diversified production methods provided enormous employment opportunities for local residents, and generated more rapid economic growth in the rural sector.

A number of papers have explored relationship between outward migration and hometown business in developing countries. Massey and Parrado (1998) claim that Mexican immigrants in the United States significantly support business formation and investment in their hometown. McCormick and Wahba (2001) show the impacts of return migrants on the characteristics and nature of hometown non-farm enterprises in Egypt. Rapoport (2002) provides a simple theoretical framework in which migration activities help households overcome liquidity constraints and increase local investment. Mesnard (2004) shows that Tunisian migrant workers accumulate financial capital in foreign countries for the purpose of investment upon returning. Even though many scholars have studied the relationship between migration and hometown business in other countries, only a few studies set out to understand the similar issues in China. Murphy (2002) argues that migrant workers made tremendous contributions to their hometown non-farm business. Out of all new projects in the survey with annual product values of more than one million yuan, 63% were created by migrant workers. However, Murphy's work is mainly descriptive with no empirical tests. Zhao (2002) shows that migrants have made positive contribution to productive investments in their hometown, using a cross-sectional data set. Unfortunately, Zhao (2002) does not control for unobserved heterogeneity at the household level. Using a self-collect data set, de Brauw and Rozelle (2008) find some evidence in the descriptive analysis that migrant and return migrant households have had higher investment levels between 1995 and 2000 than non-migrant households. Even though their empirical tests find no significant relationship between migration and business investment, they recognize that it "results from our ability, through the use of our data set, to control for more unobserved heterogeneity than other authors have." Thus, the literature has not provided a clear conclusion for China's case.

To address the gap in the literature, a dynamic bivariate probit model is applied to the China Rural Households Survey Data from 1995 to 1999. The empirical model is adopted to better control for unobserved heterogeneity. The time period is chosen because outward migration was increasing most rapidly in the late 1990s, which had tremendous impact on both urban and rural economy (Knight and Song, 1999; de Brauw and Rozelle, 2008). The empirical results point to several key conclusions: first, a direct and negative relationship is found between migration and non-farm business. Rural households which have sent some family members to migrate to urban areas are less likely to enter rural non-farm business because of time and labor constraints. Starting and operating rural non-farm business demand considerable amount of labor input. It is more difficult for some small households to be active in both non-farm business and migration activities. Second, an indirect and positive relationship is found between migration and non-farm business, which captures the positive correlation between unobserved heterogeneities of migration and of non-farm business. The unobserved characteristics affect the likelihood of migration and non-farm business in the same direction. For instance, families with broader social net-work may find it easier to migrate to urban areas, as well as to start a business. Similarly, access to market information, ambition, and entrepreneurial skills may all affect migration as well as business operation. In addition, households with better education, larger family size and a higher male proportion are more likely to have migrating family members and to engage in rural non-farm business.

The paper is organized as follows. Section two will discuss the data utilized and present the basic empirical model that will be analyzed. Section three will present and interpret the empirical results, while section four will summarize the paper.

2. Data and the Empirical Model

The data utilized to investigate the relationship between migration and rural non-farm business are taken from rural household surveys conducted by the Ministry of Agriculture Research Center for Rural Economy (RCRE) in Beijing. Household-level surveys were conducted in over 100 villages in ten provinces (Shanxi, Jilin, Jiangsu, Zhejiang, Anhui, Henan, Hunan, Guangdong, Sichuan, and Gansu). In each province, counties in the upper, middle and lower income brackets were randomly selected, from which a village was then randomly chosen. About 60 households were randomly selected in each village and surveyed each year. The survey provides detailed household level information on labor and population, land, productive assets, agricultural production and sales, household business and management activities, total household income and expenses, and consumption and durable goods. Between 1995 and 1999, the survey followed 5626 rural households. The summary statistics is provided in Table 1.

About 45% of rural households have at least some family members who are migrant workers in urban areas, and 22% of them own a non-farm business. The average length of education is only 6.68 years, meaning rural individuals in the survey only finished their primary school on average. Proportion of males exceeds that of female by a small margin. 54.17% of rural population in the survey are male. A rural household has about 2.61 labor (excluding migrant workers). Both deposits and value of production assets are converted to be in the unit of 1995 Chinese Yuan. Average annual household deposits is 2364.02 Yuan, or 285 US Dollars. Average value of production assets is 2274.34 Yuan, or 274 US Dollars. The dummy variable of location shows that 27% of surveyed households are in coastal provinces. Lastly, rural households have an average land holding of 2.62 Mu, or 0.17 Hectare.

Table 1 Variable Definition and Summary Statistics

Variable	Definition	Mean	Standard Deviation
MIG	1 if some family members are migrant workers, and 0 otherwise	0.45	0.49
BUSI	1 if the household owns a non-farm business and 0 otherwise	0.22	0.41
EDU	Average length of education of all family members (migrant family members included)	6.68	2.47
FRACMALE	Fraction of male in all family members (migrant family members included)	54.17%	21.39%
NUMLABOR	Number of non-migrant labor in the household	2.61	1.10
PCASSET	Per-capita value of productive assets (Yuan)	2274.34	8999.88
PCDEPOSITS	Per-capita deposits in banks	2115.05	32383.7
COASTAL	1 if the household is in a coastal province and 0 otherwise	0.27	0.44
LAND	Average holding of land between 1995-99 (Mu)	2.62	3.47

A bivariate probit model is adopted to estimate direct and indirect interactions between migration activities and non-farm business ownership. The econometric model methods are well elaborated in Allessie, Hochguertel and Soest (2004), Wooldridge(2005), Stewart (2007), and Shigeki (2008). The structural model includes two equations: equation (1) is a probit model on whether or not a household has some members migrate to urban areas, and equation (2) is a probit model on whether or not a household owns a rural non-farm business.

$$MIG^*_{i,t} = \beta_0 + MIG_{i,(t-1)}\beta_1 + BUSI_{i,(t-1)}\beta_2 + MIG_{i,0}\beta_3 + BUSI_{i,0}\beta_4 + X'_{it}\Theta + \alpha_{1,i} + u_{1,it} \quad (1)$$

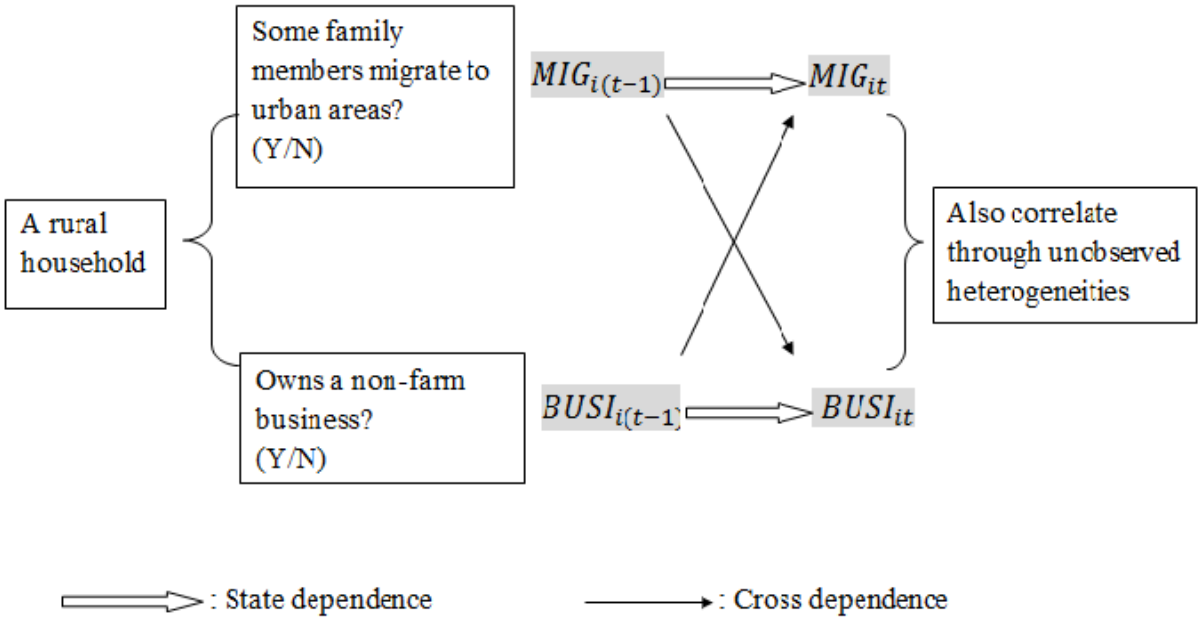
$$BUSI^*_{i,t} = \gamma_0 + MIG_{i,(t-1)}\gamma_1 + BUSI_{i,(t-1)}\gamma_2 + MIG_{i,0}\gamma_3 + BUSI_{i,0}\gamma_4 + X'_{it}\Gamma + \alpha_{2,i} + u_{2,it} \quad (2)$$

$MIG^*_{i,t}$ and $BUSI^*_{i,t}$ are unobserved latent variables. The binary variable *MIG* equals 1 if a household has some migrant family members, and 0 otherwise. Similarly, the binary variable *BUSI*equals 1 if a household owns a non-farm business and 0 otherwise. The lagged migration ($MIG_{(t-1)}$ and non-farm business ownership ($BUSI_{(t-1)}$) are included to capture the state dependence and cross dependence. State dependence shows the effects of the lagged migration on the current migration status, and the lagged business ownership on the current business.

Cross dependence presents the effects of the lagged migration on the current business ownership, and the lagged business ownership on the current migration status. The initial conditions of migration (MIG_0) and business ownership ($BUSI_0$) take care of the initial condition problem (Heckman (1981), Wooldridge (2005)). $X_{it}^{'}$ is a vector including controls of demographic characteristics, such as education length, fraction of male family members, number of non-migrant labor, (log) value of productive assets in the previous year, (log) value of deposits in the previous year, dummy variable indicating whether in coastal provinces, and average land holding. $\alpha_{1,i}$and$\alpha_{2,i}$are time invariant random effects affecting migration and non-farm business ownership respectively. $u_{1,it}$ and$u_{2,it}$ are time variant exogenous random shocks.

There are two options to estimate the structural model. If the random effects ($\alpha_{1,i}$and $\alpha_{2,i}$) are assumed to be uncorrelated, and the exogenous shocks ($u_{1,it}$ and $u_{2,it}$) are assumed to be uncorrelated as well, then the two equations can be estimated individually. In other words, the two equations are treated as two independent univariate probit models. The second option is to treat the two equations as part of a bivariate probit model, and estimate them simultaneously (Figure 1). Unlike the first one, the second method recognizes the correlation between error terms in equations (1) and (2). Following Alessie, Hochguertel and Soest (2004), Stewart (2007) and Shigeki (2008), the random effects $\alpha_{1,i}$ and $\alpha_{2,i}$ follow a bivariate normal distribution with correlation coefficient ρ_α, and the time variant random error terms $u_{1,it}$ and $u_{2,it}$ follow a bivariate normal distribution with zero means, and both of their variances are normalized to one. The correlation coefficient between $u_{1,it}$ and $u_{2,it}$ is ρ_u.

Figure 1 Illustration of Bivariate Probit Model



The univariateprobit model is straightforward to estimate, but it is inefficient and fails to recognize the correlation between unobservables. Nevertheless, the univariateprobit still provides unbiased estimates, as long as all the covariates are uncorrelated with error terms. Therefore, the univariateprobit model is used as a robust check for the bivariate probit model.

3. Empirical Results

(i) Direct interactions between migration and non-farm business

Recall that state dependence refers to the effect of $MIG_{(t-1)}$ on MIG_t , and the effect of $BUSI_{(t-1)}$ on $BUSI_t$. Cross dependence refers to the effect of $MIG_{(t-1)}$on $BUSI_t$, and the effect of $BUSI_{(t-1)}$on MIG_t. As shown in Table 2 (rows 1 and 2), the state dependence coefficients are estimated to be 0.9630 for the migration equation, and 1.2974 in the non-farm business equation.

The cross dependence coefficients are -0.2544 in the migration equation and -0.1794 in the non-farm business equation. The estimates provide the *direct* effects from a lagged status to a current status. The positive state dependence effects indicate a strong tendency of rural households to continue their status from the previous period. In other words, if a household had some family members migrate to cities last period ($MIG_{t-1} = 1$), they are more likely to continue working as migrant workers this period ($MIG_{t-1} = 1$); if a household had a non-farm business last period ($BUSI_{t-1} = 1$),, it is more likely to stay in the business this period ($BUSI_t = 1$), The negative cross dependence effects show that rural households are reluctant of switching jobs and sectors. If a household had some family members working in cities last period, it is less likely to run a rural non-farm business this period; similarly, if a household was running a non-farm business last period, it is less likely to send some family members to migrate to urban sectors.

Table 2 Bivariate Probit Model Estimation Results

		Migration equation		Business equation	
	Variable	Coefficient	S.E.	Coefficient	S.E.
[1]	$MIG_{(t-1)}$	0.9630***	-0.0398	-0.1794***	-0.0526
[2]	$BUSI_{(t-1)}$	-0.2544***	-0.0548	1.2974***	-0.0608
[3]	MIG_0	0.9669***	-0.053	-0.0379	-0.0413
[4]	$BUSI_0$	0.0241	-0.0526	0.9592***	-0.0821
[5]	EDU	0.0993***	-0.0227	0.0912***	-0.0231
[6]	$FRACMALE$	0.1462**	-0.0625	0.0669	-0.0657
[7]	$NUMLABOR$	0.2319***	-0.0134	-0.0021	-0.0125
[8]	$\log(PCASSET_{t-1})$	-0.0188***	-0.0058	0.0130**	-0.0057
[9]	$\log(PCDEPOSIT_{t-1})$	-0.0048	-0.0035	-0.0037	-0.0036
[10]	$COASTAL$	0.0851***	-0.0352	0.3755***	-0.0359
[11]	$LAND$	-0.0497***	-0.0068	-0.0545***	-0.0065
[12]	$INTERCEPT$	-1.6252***	-0.085	-1.7306***	-0.0921
[13]	σ_α	0.6886***	-0.0368	0.5777***	-0.0731
[14]	ρ_α	0.2450***	-0.0643		
[15]	ρ_u	-0.4071***	-0.0315		
[16]	$Log\ Likelihood$	-17696.6			

At least three reasons contribute to the direct effects. First, both migration activities and running a non-farm business incur certain sunk costs. For example, migrant workers pay application fees to acquire "three certificate and one card" in order to work in cities legally (Zhao, 1999). Once they obtain the required legal certificates, they tend to work in urban areas for more than one year. Similarly, rural households entering non-farm business sector need to purchase necessary machines and tools. It makes more economic sense for them to stay in business to bring long-run benefits. Second, migration activities and non-farm business operation both require certain sector-specific skills. Urban manufacturing companies prefer to recruit migrants with reading and writing ability who can learn the necessary skills quickly through on-the-job training. To operate a non-farm business, the owner needs to have at least basic book-keeping knowledge, reading and writing ability, and some management skills. After rural individuals with sector-specific skills self select into migration or non-farm business, they tend to stay in that sector rather than frequently switching jobs. Third, the time and labor constraints facing rural households explain why the lagged migration status has negative effect on the current business ownership status, and why the lagged business ownership status has negative effect on the current migration status. The total time and labor available for rural households are limited. When some household members migrate and work in cities, they contribute less or even zero time and labor to hometown production. Similarly, when a rural household is actively engaging in a non-farm business, it is less likely to send family members to migrate to cities.

Notice that, if the possible correlation between error terms was ignored, then the conclusion would have been that families with migrant workers are less likely to enter rural non-farm business. However, there are two effects at work: direct and indirect. Part (i) presents the coefficient estimates of the state and cross dependence which confirm the direct channel. Part (ii) will show a positive indirect interaction between migration and non-farm business.

(ii) Indirect interactions between migration and non-farm business

In Table 2, the standard deviation of random effects, α_1 and α_2 are estimated to be 0.6886 and 0.5777 in the bivariate probit model (row 13). The standard deviation of pure random shocks $u_{1,t}$ and $u_{2,t}$ are normalized to one. Therefore, 32.18% of total error component variance in the migration regression can be explained by variations in random effect, α_1; similarly, 25.02% of the total error component variance in the non-farm business regression can be explained by variations in random effect , α_2.

Furthermore, the bivariate probit model assumes that the two random effects in equations (1) and (2) are correlated. the random effects are correlated through, ρ_α, which is estimated to be 0.2450 and significant (row 14). The positive correlation coefficient ρ_α confirms an *indirect relationship* between migration and non-farm business. Certain unobserved household characteristics affect both migration and non-farm business ownership in the same direction. For example, ambitious and diligent households are more likely to migrate as well as to operate a non-farm business. Families with a broader social network are more likely to migrate and to run a business. If some family members migrate while others stay in rural hometown, their communications generate spill-over effects from the ones who migrate to the ones who stay.

(iii) Coefficient estimates of other explanatory variables

The estimated coefficients of demographic characteristics, such as education, proportion of male family members, and the number of labor, are consistent with expectations. In Table 2, the coefficient of education is 0.0993 in the migration regression, and 0.0912 in the non-farm business regression, both significant (row 5). This finding confirms the economic value of education in rural China, which increases a rural individual's ability to seek employment opportunity outside of agriculture, either in urban sector or in rural non-farm sector. The coefficient of male fraction is 0.1462 in the migration regression, and 0.0669 in the non-farm business regression, even though it is insignificant in the latter one (row 6). This result indicates that men are significantly more likely to migrate to cities than are women. There are at least two reasons. First, women in more traditional rural areas usually stay at home to take care of children and elderly, and men as the main breadwinners are encouraged to explore more outside employment opportunities to support the family. Second, rural migrant workers usually have little social network in cities, lower education level, and no urban household registration. Therefore, the available jobs for them are limited to sectors such as construction, manufacturing and transportation, which demand more male workers. The coefficient of number of labor is 0.2319 in the migration regression (row 7), which indicates that a larger family is more likely to send some family members to work in urban sectors. The result coincides with Taylor, Rozelle, and de Brauw (2003), who find that an additional family worker increased the chance of an individual would migrate in the 1990s by 28%.

The coefficient of lagged productive assets is -0.0188 in the migration equation, and 0.0130 in the non-farm business equation, both significant (row 8). Families with more productive assets in rural areas are less likely to participate in migration activities, but more likely to have non-farm businesses. Policy makers hoped that the continuous growth of rural non-farm sectors could help transform rural regions to a densely populated "urbanized countryside" (NBSC, 1999a, 1999b). The empirical results here show that productive assets are crucial to non-farm business development. Therefore, a viable policy instrument is to provide rural households necessary productive assets through loans to facilitate the development of non-farm business sector. The coefficients of the dummy variable on location are positive and significant in both equations. The estimates are 0.0851 in the migration equation, and 0.3755 in the non-farm business equation (row 10). Since the economic reform in 1978, coastal cities have always been growing much more rapidly than the national average. Throughout the 1990s, coastal areas were better positioned to participate in foreign trade, attract foreign investment and absorb advanced technologies. Furthermore, the traditional experience with labor-intensive manufacturing was widespread in coastal areas (Naughton, 2007). As coastal cities grew richer, the demand for new office buildings, residential buildings, and shopping centers skyrocketed. The fast growing manufacturing and construction sectors in coastal areas absorbed the increasing inflows of rural migrant workers. Compared with rural people in inland provinces, people from rural areas adjacent to coastal cities find it more convenient to migrate, because they travel a shorter distance, and they are familiar with the dialects and regional culture. For the prospect of running non-farm business, rural areas in coastal provinces enjoy positive externalities, such as good infrastructure, a healthy business environment, and quick access to up-to-date technology. Therefore, rural households in coastal provinces are more likely to start a non-farm business.

(iv) Robustness

If the error terms in equations (1) and (2) are assumed to be uncorrelated, then the two equations can be estimated as two independent univariateprobit models. The separate estimation is less efficient and provides no insight into correlated unobservables, yet the estimates are still unbiased and can be used as a robust check for the bivariate probit model. The coefficient estimates from univariate and bivariate models are expected to be qualitatively consistent. The estimation results of the two univariateprobit regressions are included in Table 3.

Table 3 Robust Check: UnivariateProbit Estimation Results

		Migration equation		Business equation	
	Variable	Coefficient	S.E.	Coefficient	S.E.
[1]	$MIG_{(t-1)}$	0.8583***	-0.0333	-0.1233***	-0.0325
[2]	$BUSI_{(t-1)}$	-0.1183***	-0.0397	1.410***	-0.0525
[3]	MIG_0	1.1260***	-0.05	-0.0943	-0.0422
[4]	$BUSI_0$	-0.1254	-0.0537	1.3800***	-0.091
[5]	EDU	0.1084***	-0.0299	0.0977***	-0.0278
[6]	$FRACMALE$	0.1462**	-0.0587	0.0805	-0.0766
[7]	$NUMLABOR$	0.1510***	-0.0307	0.0015	-0.0133
[8]	$\log(PCASSET_{t-1})$	-0.0215***	-0.0056	0.0185**	-0.07
[9]	$\log(PCDEPOSIT_{t-1})$	-0.0057	-0.0043	-0.0027	-0.0045
[10]	$COASTAL$	0.0883***	-0.0433	0.4477***	-0.0397
[11]	$LAND$	-0.0488***	-0.0078	-0.0624***	-0.0115
[12]	$INTERCEPT$	-1.7140***	-0.1198	0.7912***	-0.101
[13]	σ_α	0.8242***	-0.031	0.5777***	-0.0409
[14]	$Log\ Likelihood$	-10350.3		-7395.63	

Comparing coefficient estimates in Table 2 and Table 3, estimators are mostly consistent in signs and levels. The bivariate probit model provides estimate of correlation coefficient between unobserved heterogeneities, but univariateprobit model does not. In addition, the log-likelihoods for the two univariateprobit regressions are -10350.26 and -7395.63, with a sum of -17745. The log-likelihood of the bivariate probit regression is -17696.6. Therefore the bivariate probit regression has higher log-likelihood (hence more efficient) than the two univariateprobit regressions. The comparison confirms that the bivariate probit model is robust and more efficient.

(v) Average partial effects (APE)

Table 4 shows average partial effects (APE). While holding other variables at their means, APE measures the contribution of a marginal change in the variable of interest. The probability of a household having migrant family members at time *t* is 0.2647 higher if they had sent some members to urban areas at time (*t-1*). The probability of a household running a non-farm business at time *t* is 0.2355 higher if they have had the business at time (*t-1*). An additional year of education increases the chance of migration by 0.0269, and increases the probability of business ownership by 0.0141. If the male proportion in a household increases by 1%, the probability of some family members migrating to cities rises by 0.0374, and the probability of having business rises by 0.0117. An additional labor in the family raises the chance of some family members leaving for urban sectors by 0.0618. If the value of productive assets in the previous period increases by 1%, the probability of migration decreases by 0.0053, but that of running a non-farm business increases by 0.0027. Ceteris paribus, the likelihood of households in coastal provinces running a non-farm business is 0.0725 higher than those in inland provinces.

Table 4 Average Partial Effects

		Migration equation		Business equation	
	Variable	Coefficient	S.E.	Coefficient	S.E.
[1]	$MIG_{(t-1)}$	0.2647***	-0.0089	-0.0179***	0.0049
[2]	$BUSI_{(t-1)}$	-0.0293***	-0.0052	0.2355***	0.0339
[3]	MIG_0	0.3643***	0.0011	-0.0137***	0.0008
[4]	$BUSI_0$	-0.0311	0.0031	0.3552***	0.0344
[5]	EDU	0.0269***	0.0066	0.0141***	0.0046
[6]	$FRACMALE$	0.0374***	0.0019	0.0117***	0.0018
[7]	$NUMLABOR$	0.0618***	0.0071	0.0002	0.0026
[8]	$\log(PCASSET_{t-1})$	-0.0053***	0.0007	0.0027***	0.0005
[9]	$\log(PCDEPOSIT_{t-1})$	-0.0014*	0.0007	-0.0004	0.0004
[10]	$COASTAL$	0.0220	0.0187	0.0725***	0.0045
[11]	$LAND$	-0.0121**	0.0048	-0.0090***	0.0004

4. Concluding Remarks

This paper has sought to analyze the relationship between rural-urban migration and rural non-farm business ownership in China. Outside of agricultural sector, a rural household face two employment opportunities: migrating to urban sectors, and running a non-farm business. For a rural household, the two options are not mutually exclusive, because some family members can be migrant workers in urban areas while others work in business in their hometown. Migration and business activities can affect each other through two channels: direct and indirect. Migration and non-farm business have a negative relationship (direct) and a positive relationship (indirect). The findings of both effects expand the prior literature which find positive or no effect of migration on rural non-farm business (Zhao, 2002; de Brauw, Alan and Scott Rozelle, 2008). One possible explanation for the difference between the findings in this paper and the earlier studies is that, the bivariate probit model controls for the unobservables and estimate the correlation between unobserved random effects.

The direct effects show that, rural households with migrant family members are *less* likely to run non-farm business, and rural households in the non-farm business are *less* likely to send family members to urban sectors. The intuition is simple: every household faces time and labor constraints. Households, especially the smaller ones, find it difficult to actively engage in both migration and non-farm business. The indirect effects indicate that, rural households with migrant family members are *more* likely to run non-farm business. Certain unobserved family characteristics impact the probability of both activities in the same direction. For instance, families with a broader social network, more ambition, better coordination among family members, a good access to the market information, are more likely to have migrant family members as well as to own a non-farm business.

The paper also provides several byproducts, which are consistent with previous research. Education increases the prospect of a rural individual relocate to urban areas and find higher paid jobs. Rural households with better education are more likely to have a non-farm business. The return to education for rural individuals is that they are more capable of seeking employment opportunities off-farm. A family with too many women is less likely to participate in migration activities as well as non-farm business. Households with higher level of assets are more likely to run non-farm business. Compared with those from inland countryside, people from rural areas in coastal provinces are much more likely to migrate to cities, and much more likely to work in rural non-farm business.

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