

Regional differences in self-employment in China

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Abstract This paper investigates the impact of personal characteristics and institutional environment on the decision to be self-employed in China. It is shown that a difference in the likelihood of being self-employed exists between urban and rural areas. Our results show that institutional differences between rural and urban areas influence self-employment decisions. Factors that exert a consistent impact regardless of the local institutional environment are marriage, education, money spent on weddings and gifts, economic openness, and accessibility of information. The impact of other factors differs across rural and urban areas. These factors include family ownership of real estate, experience, gender, population density, the management capacity of local government, and the development of private economy in the local community.

Keywords Self-employment · Occupational choice · Institutional environment · Economic development

JEL classifications J24 · L26 · O12

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1 Introduction

Entrepreneurship or self-employment has positive impacts on economic growth (Berkowitz and DeJong 2005; Carree and Thurik 2008; Li et al. 2012). Factors influencing the propensity to become an entrepreneur can be broadly divided into three extensively investigated categories: personal attributes (as summarized by Shane 2003), characteristics of personal behavior (Alvarez and Barney 2007; Grichnik et al. 2010; Sarasvathy 2008), and institutional environment (Alesina et al. 2005; Chemin 2009; Djankov et al. 2002). It has been shown that the liquidity constraint on self-employment can be relieved by using housing as collateral (Adelino et al. 2015) or receiving windfalls (Lindh and Ohlsson 1996); health insurance is another method to reduce the risk of self-employment (Gumus and Regan 2015). It is worthwhile to note that whether the impact of a particular factor is positive or negative might depend on its context, and endogeneity problem might exist. In particular, individuals who have a reciprocal relationship with institutional environments (Xin and Pearce 1996; Xu and Yao 2015) could effectively choose their institutional environments through migration (Beladi and Kar 2015; Constant and Zimmermann 2006). Does a particular factor have the same impact on the creation of an entrepreneur under different institutional environments? China, as the largest developing country and second largest economy in the world, provides a good opportunity for us to investigate this question.

Private economy was not allowed to exist in China before the economic reform and opening-up policies in

1978. Following the enforcement of household registration system (or Hukou system) in 1954 that restricted internal migration, different industrial policies and national fiscal budget arrangements are practiced between rural and urban areas. While government policy mainly supported the development of non-farm sector, including entrepreneurship, in rural China at the beginning of the economic reform, the focus turned to state-owned enterprises in urban China since the 1990s (Huang 2008). A piecemeal institutional system for private enterprises meant that at the local level, bureaucrats and powerful individuals were able to interfere in the operations of private businesses. As opposed to contractual means, entrepreneurs relied on social relationships—such as through kinship, being from the same hometown, or having the same alma mater—in order to conduct business (Ahlstrom et al. 2000). Restriction on internal migration serving to consolidate differences in local dialects and religious beliefs had created greater uncertainty and information asymmetries in investment decisions and in human resource management (Dow et al. 2016; Gong et al. 2011).

Using data from the China Health and Nutrition Survey (CHNS), this paper examines the effects of institutional environment, individual characteristics, and community conditions on an individual's decision to undertake non-agricultural, self-employed work. We find that marriage, education, money spent on weddings and gifts, economic openness, and accessibility of information exert a consistent impact regardless of the local institutional environment. However, the impacts of family ownership of real estate, experience, gender, population density, management capacity of government, and the development of private economy in the local community differ across urban and rural areas.

Existing literature on entrepreneurship in China mainly discusses entrepreneurial values, traits, and behavior among entrepreneurs (Ahlstrom and Ding 2014; Hayton et al. 2002; Lau and Busenitz 2001; Tan 2002). Limited attention has been paid to the factors that lead to full-time self-employment in urban China (Liu and Zhang 2017; Lu and Tao 2010; Wang 2012; Yueh 2009). This paper contributes to the existing literature in three ways. First, it enriches the literature on the relationship between institutional environments and entrepreneurial decisions by validating that the influence of a factor on individuals can be affected by the institutional environment in which they operate. Specifically, an individual's decision to undertake entrepreneurship

depends on four factors: access to information, the ability to create and/or discover opportunities, the ability to exploit opportunities, and comparative advantage of self-employment over wage work to the person. Second, this paper examines how regional differences affect entrepreneurship in rural and urban China by analyzing individuals in full-time self-employment as well as those in part-time self-employment in rural areas. Finally, this study provides policy suggestions to facilitate the development of entrepreneurship in emerging economies, particularly to the design of institutional environments that requires comprehensive consideration. For example, family-owned real estate is an important tool in alleviating the liquidity constraints confronting potential entrepreneurs (Evans and Jovanovic 1989; Hurst and Lusardi 2004; Wang 2012). However, if real estate remains illiquid, the likelihood of being self-employed in rural China will decline.

2 Literature review

We investigate non-agricultural self-employment in this paper. Entrepreneurial opportunities are defined as situations in which entrepreneurs believe that reallocating resources will yield profits that exceed opportunity costs. These profits compensate for the costs of illiquidity, risk, and uncertainty (Venkataraman 1998). There are two theories on the formation of entrepreneurship opportunities: opportunity creation theory and opportunity discovery theory.

In opportunity creation theory, Alvarez and Barney (2007, 2010) argue that opportunities are endogenously created by entrepreneurs and their activities. Entrepreneurs make decisions under uncertainty but, otherwise, are not significantly different from people in other types of jobs. Opportunity discovery theory views entrepreneurial opportunities as being independent of entrepreneurs (Shane and Venkataraman 2000). Kirzner (1973) and Schumpeter (1934) present two different perspectives on the sources of entrepreneurial opportunities. Kirznerian opportunities exist in an equilibrium market. They are generated from misjudgments made by other market participants and do not require new information. In contrast, Schumpeterian opportunities come from innovation, and new information is vital for their emergence. Empirical evidence illustrates three main sources of Schumpeterian opportunity (Shane 2003): technological development, political and regulatory changes, as

well as social and demographic changes. The notion of innovation not only encompasses technology but also extends to management and market exploitation (Acs and Audretsch 2003).

Davidsson (2015) and Short et al. (2010) point out that the divergence between theories of entrepreneurial opportunities results from different definitions of opportunities. Although Shane (2012) addresses this divergence by separating entrepreneurial opportunities from “business ideas,” Alvarez and Barney (2013) argue that “opportunities are objective” is an untenable assumption.

We believe that China is a special case where neither the opportunity creation theory nor the opportunity discovery theory can explain the formation of entrepreneurship opportunities. It is because almost nothing, from the legislation system to the setup of the frameworks of production factor and consumption markets, is ready for potential entrepreneurs at the beginning of the economic reform since 1978. To meet the demand for entrepreneurial activities, entrepreneurs must apply effectuation, as put forward by Sarasvathy (2001, 2008).

3 Background

Since the establishment of the People’s Republic of China in 1949, private economy no longer has any legal standing (Ahlstrom et al. 2000). However, the economic reforms since 1978 have gradually changed China’s economic system. In October 1992, the Fourteenth Central Committee set the goal of establishing a “socialist market economic system.” Since then, various types of economic ownership have been developed (Naughton 1996). As the market economy developed, the disadvantage of not having a private sector became clear. Knowledge of entrepreneurship was lacking, and legal and governmental administrative systems were similarly ill-prepared for the development of entrepreneurship.

Another factor that significantly influenced individual entrepreneurial opportunities was the polarization between rural and urban areas in China (Huang 2008). Rural and urban areas have been administratively separated since 1949, with the Chinese government exercising strict control over population flows between cities and the countryside. Public facilities in urban areas are mainly government-funded, while those in rural areas are largely self-financed. Albeit migration between the

two areas has become more common today, as compared to their urban counterparts, rural migrants are at a disadvantage in terms of receiving publicly allocated resources. The development in rural areas has been dominated by traditional agriculture, while that in urban areas has been steadily fueled by industrialization. Consequently, two relatively independent labor markets were formed, giving rise to substantially different opportunity costs of being self-employed. Inadequate financial infrastructure also hindered the economic development of rural areas. Though a variety of formal financial institutions were established in rural areas, according to the *Almanac of China’s Finance and Banking* (1987 and 2002), the total number dropped from 97,074 in 1986 to 86,014 in 2001. In addition, the supply of formal financial services has also been insufficient (He 1999). Given the prevailing business uncertainty and the invisibility of entrepreneurial ability, it is difficult for rural residents to seek funds from formal financial institutions. As the number of bank branches declined, rural residents had to increasingly turn to informal financial services, which carried relatively high borrowing costs.

4 Econometric model and hypotheses

With three career choices (wage work, full-time self-employment, and part-time self-employment), we estimate a multinomial logit (MNL) model for the rural sample. The probability that an individual i chooses j as his or her career option is estimated as follows:

$$P_i(\text{job} = j) = \alpha + \beta_j X + \varepsilon_i, j = 0, 1, 2 \quad (1)$$

where $P_i(\cdot)$ is the probability that an individual i chooses j as his or her career option, X is a $K \times 1$ vector consisting of personal characteristic variables and community variables (continuous or discrete), and β_j is a $1 \times K$ vector of parameters for independent variables in relation to career choice j . $j = 0$ represents the base group, wage work. $j = 1$ represents full-time self-employment, while $j = 2$ represents part-time self-employment. We evaluate the fitness of the model using three statistics: the likelihood ratio (LR) chi-square test, the percentage of correct predictions, and McFadden’s pseudo R -square. The Hausman test is conducted to investigate the validity of the assumption of the independence of irrelevant alternatives (IIAs) in the rural sample and in the whole sample.

For urban areas, we combine the part-time and full-time self-employment observations because there are insufficient observations of the former. We apply the probit model to the urban sample, with wage work as the base group. The regression model for the probability that an individual i chooses j as his or her career option is given by

$$P_i(\text{job} = j) = \alpha + \beta_j X + \varepsilon_i, j = 0, 1 \quad (2)$$

where $P_i(\cdot)$ is the probability that an individual i chooses j as his or her career option. In the base group, $j=0$ represents wage work and $j=1$ represents part-time or full-time self-employment. X stands for a $K \times 1$ vector of personal characteristic and community variables; β_j is the corresponding $1 \times K$ parameter vector for career choice j . The fitness of the model is evaluated using the same statistics as in the MNL analysis for the rural sample.

To examine the effects of the factors, we test two main hypotheses, each with several subhypotheses.

4.1 Hypothesis 1 (H1)

If a factor reduces/exacerbates the cost and risk of self-employment in both rural and urban areas (e.g., better access to information, higher ability to create and/or discover opportunities, and/or higher ability to exploit opportunities), it will exert a positive/negative impact in an individual's propensity to be self-employed regardless of the local institutional environment.

4.1.1 H1.1: the likelihood of self-employment increases if an individual is married

Marriage facilitates the effective exploitation of entrepreneurial opportunities by achieving economies of scale, providing collective goods, and allowing risk-sharing under uncertainty (Weiss 1997). Marriage also increases the social ties of an individual which increase his or her access to information through interactions with other people (Johansson 2000). The effect of marriage on the likelihood of self-employment is positive in both rural and urban areas.

4.1.2 H1.2: education has an inverted U-shaped effect on self-employment decisions in both urban and rural samples

An individual who receives education may acquire managerial skill and thus increases his or her propensity to

be self-employed (Lucas Jr. 1978). However, people with high educational attainment have a higher opportunity cost of switching from wage work to self-employment (Evans 1989; Kidd 1993). Additionally, the content and composition of one's educational attainment also influence the decision of being self-employed. The versatility of an individual in different fields enhances his/her probability to be an entrepreneur (Lazear 2004; Stuetzer et al. 2013), while an individual with higher educational attainment in a specialized subject has a lower propensity to be self-employed.

4.1.3 H1.3: individuals who come from a family with higher expenditure on weddings and gifts are more likely to be self-employed

People who spend more on weddings and gifts are likely to be wealthier and have a higher chance of becoming entrepreneurs, since those without sufficient funds are excluded from entrepreneurship (Evans and Jovanovic 1989). This prediction applies to both urban and rural samples.

4.1.4 H1.4: economic openness has a negative effect on the likelihood for an individual to be self-employed

Although globalization enhances the integration of markets and resources, prospective local entrepreneurs are not likely to benefit much as they are only familiar with the local market and local culture. In addition, a special economic zone is always more industrialized with more job vacancies, such that the opportunity cost of being self-employed is higher. The effect of economic openness is negative in both urban and rural samples.

4.1.5 H1.5: an individual's propensity to be self-employed is higher when community infrastructure that facilitates access to information improves

Well-developed infrastructure is beneficial to information transfer and can help reduce the opportunity cost of entrepreneurial decisions and transaction costs of economic activities (Mair and Marti 2009). This relationship is positive in both urban and rural samples.

4.2 Hypothesis 2 (H2)

If the factor that reduces/exacerbates the cost and risk of self-employment is influenced by institutional

environments, it might have different impacts on the propensity to be self-employed across rural and urban areas.

4.2.1 H2.1: gender has a different effect on self-employment in rural and urban China

Men and women make different entrepreneurial decisions (Leoni and Falk 2010). People in rural China tend to attach greater importance to men, and men have a relatively higher social status and greater familial responsibilities. Family roles determine the allocation of time between home and labor market activities (Dolton and Makepeace 1987). Therefore, men in rural areas have a relative advantage in obtaining entrepreneurial experience and resources to exploit entrepreneurial opportunities. However, in urban areas, women are discriminated against in the wage job market (Moore 1983; Sowell 1981), which makes entrepreneurship a more viable career option, assuming that discrimination does not spill over into capital markets (Collette and Aubry 1990; Hisrich and O'Brien 1981). Male in rural area are more likely to become entrepreneurs than their counterparts in urban area, while female in rural area are less likely to be self-employed than those in the urban areas.

4.2.2 H2.2: career experience influences entrepreneurial choices differently in rural and urban areas

Work experience provides knowledge and offers an individual a comparative advantage in accessing new information (Shane 2000). It also helps an individual identify entrepreneurial opportunities (Romanelli and Schoonhoven 2001). Given the insufficient channel to obtain financial funding, work experience is particularly welcomed by rural residents as it can increase their personal savings to finance their entrepreneurial activities. However, rich work experience may post a barrier to urban residents for switching into self-employment as they may face a high opportunity cost for giving up their wage work.

4.2.3 H2.3: family real estate lowers the propensity for entrepreneurship in rural areas

Real estate is an asset which can serve as an important financial support to entrepreneurship. However, its significance is much lower in rural areas than in urban areas

because during our sample period, no financial institutions in rural China accepted real estate as collateral for loans.

4.2.4 H2.4: population density has an opposite influence on entrepreneurial choices in rural areas, as compared to urban areas

Population density generally increases in the process of urbanization. Urbanization facilitates communication and dissemination of information and increases the number of entrepreneurial role models in a given area (Bygrave and Minniti 2000; Storey and Tether 1998). Urbanization also makes opportunities more profitable as a result of economies of scale (Reynolds and White 1997; Evans and Leighton 1989; Schiller and Crewson 1997). However, in urban areas, the development of modern commerce and industry creates a vast number of paid jobs, thus increasing the opportunity cost of self-employment.

4.2.5 H2.5: the management efficiency of government has a tangible but different impact on entrepreneurial choices in rural and urban areas

Rodrik (2009) identifies five types of institutions that facilitate the operation of a market. We use an index to measure three of these: a macroeconomic stabilization system, a social security system, and a conflict management system. During our sample period, the government did not provide a social security system in rural areas. In addition, village committees, as the main political institution in rural areas, are self-financed and receive limited transfer payments from the government. Finally, a more prosperous urban economy implies that there is a higher opportunity cost of being self-employed in rural areas. Therefore, by attracting and retaining rural residents in urban areas, a sound institutional environment increases the propensity of urban residents to be self-employed but decreases that of rural residents.

5 Data description

Data collected from the China Health and Nutrition Survey encompass nine provinces, which vary substantially in terms of natural resource endowments, economic environments, and public resources. The survey contains information on economic and physical activities of

individuals, as well as detailed information on the economy, geography, and the state of community infrastructure. Observations from Liaoning Province were removed from the 1997 survey but were added again in the 2000 survey, while observations from Heilongjiang Province have been included since 1997. Data for 1989 and 1991 are omitted from the analysis to generate consistent measurements across the sample, as survey questionnaires are constantly adjusted and some characteristics were left uninvestigated. After eliminating observations with missing values in the household and community surveys, we find that the percentage of self-employed farmers is zero in the 1997 and 2000 surveys. In addition, only seven out of 3885 individuals are recorded as self-employed farmers in the 1993 survey. Thus, we exclude observations of self-employed farmers in our sample. In total, our sample covers five survey years (1993, 1997, 2000, 2004, and 2006) and consists of 14,397 observations, 3583 of which are from urban areas and 10,814 are from rural areas. The description and summary statistics of variables are given in the following subsections.

5.1 Dependent variable

Employment choices were classified into three categories: paid employment, full-time self-employment, and

part-time self-employment. Our analysis is primarily concerned with self-employment in the non-agricultural sector. When the dependent variable $job = 0$, it means an individual chooses paid employment. Similarly, $job = 1$ when an individual takes up full-time self-employment, and $job = 2$ when an individual opts for part-time self-employment.

Table 1 presents the breakdown of career choices from respondents across the five survey years. In the entire sample, 85.64% of respondents are recorded as being in wage work, while those in full-time self-employment comprise 10.53% of the entire sample. Part-time self-employment constitutes a very small proportion in the urban sample and has been at less than 1% since 2000. Part-time self-employment represents 5.07% of the rural sample in the 2006 survey. In the entire rural sample, 35.21% of individuals engaging in small businesses are shown to be employed part-time.

5.2 Independent variables

Table 2 lists the definitions of the independent variables. The statistics of the variables for the entire sample are summarized in Tables 3 and 4.

The attainment of formal education differs between the rural and urban samples. In the rural sample, the maximum number of years of education is 17, whereas

Table 1 Three career choices in the full, rural, and urban samples

	Survey year, <i>n</i> (%)					Total, <i>n</i> (%)
	1993	1997	2000	2004	2006	
Career choice						
Wage work	3425 (88.32)	2548 (85.58)	3288 (89.40)	1820 (80.21)	1247 (78.33)	12,328 (85.64)
Full-time self-employment	284 (7.32)	306 (10.26)	287 (7.80)	349 (15.38)	290 (18.22)	1516 (10.53)
Part-time self-employment	169 (4.36)	124 (4.16)	103 (2.80)	100 (4.41)	55 (3.45)	551 (3.83)
Total	3878	2980	3678	2269	1592	14,397
The rural part						
Wage work	2629 (89.48)	2128 (88.06)	2676 (91.36)	1180 (78.56)	799 (77.88)	9412 (87.06)
Full-time self-employment	171 (5.82)	179 (7.39)	154 (5.26)	228 (15.18)	175 (17.06)	907 (8.39)
Part-time self-employment	138 (4.70)	110 (4.54)	99 (3.38)	94 (6.26)	52 (5.07)	493 (4.56)
Total	2938	2419	2929	1502	1026	10,814
The urban part						
Wage work	796 (84.68)	420 (74.87)	612 (81.71)	640 (83.44)	448 (79.15)	2916 (81.38)
Full-time self-employment	113 (12.02)	127 (22.64)	133 (17.76)	121 (15.78)	115 (20.32)	609 (17.00)
Part-time self-employment	31 (3.30)	14 (2.50)	4 (0.53)	6 (0.78)	3 (0.53)	58 (1.62)
Total	940	561	749	767	566	3583

Table 2 Definitions of independent variables

Variable	Definition
Education	The number of years of formal education received ¹
Experience	The age of a respondent in the survey year minus his education and 7
Gift	The amount of money paid for weddings and gifts in the last year (RMB 1000)
Gender	The gender of the respondent (0 indicates female; 1 indicates male)
Dep_c	The presence of children below 7 years of age in the family (1 indicates that a child under 7 is present, and 0 indicates they are not)
Gender_Dep_c	The interaction term between gender and Dep_c
House	Ownership of the respondent's dwelling
Marriage	A dummy variable for marital status (0 indicates no; 1 means yes)
Village	A dummy variable denoting whether the respondent lives in a rural area (1 if they do; 0 if they do not)
Ave. wage	The average daily wage
Self. percentage	The percentage of self-employed individuals in the community in the last survey
Priv. percentage	The percentage of individuals owning private enterprises in the community in the last survey
Pop. density	Population density of the community (1000 persons/km ²)
Irrigation	The percentage of farmland that is irrigated
Ave. day	Average opening days per week of the nearest free market for people in the community
Ave. dis_f	Average distance to the nearest free market for people in the community (km)
Ave. dis_l	Average distance to the nearest big shopping mall for people in the community (km)
Road	The most common kind of local road for people in the community
Electricity	Average number of h per day with electrical power in the community
Open	A dummy variable indicating if the community is within a 2-h bus ride of a special economic zone (0 indicates no; 1 indicates yes)
Newspaper	A dummy variable signifying if the community can receive provincial daily newspapers on the day of publication (0 indicates no; 1 indicates yes)
Bus stop	A dummy variable denoting whether a bus stop exists in the community (0 indicates no; 1 indicates yes)
Train station	A dummy variable indicating whether a train station is located near the community (0 indicates no; 1 indicates yes)

Table 2 (continued)

Variable	Definition
Government	The competitiveness index of government administration in each province
1997	The 1997 survey (0 indicates no; 1 indicates yes)
2000	The 2000 survey (0 indicates no; 1 indicates yes)
2004	The 2004 survey (0 indicates no; 1 indicates yes)
2006	The 2006 survey (0 indicates no; 1 indicates yes)
Liaoning	Liaoning Province (0 indicates no; 1 indicates yes)
Heilongjiang	Heilongjiang Province (0 indicates no; 1 indicates yes)
Jiangsu	Jiangsu Province (0 indicates no; 1 indicates yes)
Shandong	Shandong Province (0 indicates no; 1 indicates yes)
Henan	Henan Province (0 indicates no; 1 indicates yes)
Hubei	Hubei Province (0 indicates no; 1 indicates yes)
Hunan	Hunan Province (0 indicates no; 1 indicates yes)
Guangxi	Guangxi Province (0 indicates no; 1 indicates yes)
Guizhou	Guizhou Province (0 indicates no; 1 indicates yes)

¹ We consider the number of years of formal education received to be the measure of a respondent's education. However, we do not have precise data on educational levels when a respondent enters a technical school—they may have entered having just completed junior middle school or may have completed senior middle school. In our paper, we assume that individuals must enter a senior middle school before they are admitted to a technical school

it is 20 in the urban sample. Zero year of formal education represents illiteracy. These results indicate that in the rural sample, no respondent received graduate education. The mean number of years of formal education is 6.69 in the rural sample, which is 3.62 years less than the urban sample's mean of 10.31 years.

Other personal characteristic variables are briefly summarized as follows: the average number of years of work experience in the rural sample is 26.08, which is approximately 3 years more than that of the urban sample. More than 80% of respondents are married. Similar gender composition is found among all respondents and those who are married, of which approximately 53% are male. In addition, more rural respondents than urban respondents have a child of less than 7 years old—the figures are 9.62% for the rural sample and 6.84% for the urban sample.

Property ownership and expenditure on weddings and gifts are used to reflect family wealth. 95.83% of

Table 3 Summary of continuous independent variables in the whole sample

Variable	Num. of observation	Mean	Std. Dev.	Min	Max
Education	14,397	7.59	4.23	0.00	20.00
Experience	14,397	25.20	15.42	0.00	86.83
Gift	14,397	0.93	1.62	0.00	45.00
Ave. wage	14,397	15.00	9.77	0.00	70.00
Self. percentage	14,397	5.40	10.97	0.00	189.00
Priv. percentage	14,397	2.22	3.71	0.00	44.78
Pop. density	14,397	2.99	6.58	0.0009	54.00
Ave. day	14,397	6.10	1.83	1.00	7.00
Ave. dis_f	14,397	1.52	2.16	0.00	26.00
Ave. dis_l	14,397	3.78	4.35	0.00	75.05
Road	14,397	2.39	0.76	1.00	3.00
Electricity	14,397	23.19	2.91	1.00	24.00
Government	14,397	48.65	8.47	34.52	70.25

respondents in the rural sample own property, while the figure is 76.44% for urban respondents. The average amount of money spent on weddings and gifts in both

urban and rural samples, adjusted for inflation with the consumer price index, is approximately RMB 440. However, the maximum amount in the rural sample is nearly triple that of the urban sample. This is a surprising observation, as most rural residents have a relatively lower income than urban residents. Given that formal financial institutions cannot satisfy rural demand for credit, gifts could serve as an informal financial resource.

We use the percentages of self-employed individuals and those with their own businesses to measure the development of private economy in the community; the numbers in the urban sample are 1.72 and 1.55 times the corresponding figures in the rural sample, respectively. The limited size of local markets in rural areas might explain the relatively low percentage of rural individuals owning their own businesses. In the urban sample, the largest percentage of self-employed residents is 189% in the 2006 survey, indicating that some residents hold more than one position in the self-employment sector.

In the urban sample, a free market, defined as a commercial space where individuals are allowed to set

Table 4 Summary of dummy independent variables in the whole sample

Variable	Num.	0	Percentage (%)	1	Percentage (%)
Gender	14,397	6715	46.64	7682	53.36
House	14,397	1295	8.99	13,102	91.01
Marriage	14,397	2628	18.26	11,769	81.74
Dep_c	14,397	13,144	91.30	1253	8.70
Village	14,397	3583	24.88	10,814	75.12
Open	14,397	8303	57.66	6094	42.34
Newspaper	14,397	8171	56.75	6226	43.25
Bus stop	14,397	5418	37.63	8979	62.37
Train station	14,397	11,601	80.58	2796	19.42
1997	14,397	11,417	79.30	2980	20.70
2000	14,397	10,719	74.46	3678	25.54
2004	14,397	12,128	84.24	2269	15.76
2006	14,397	12,805	88.94	1592	11.06
Liaoning	14,397	13,187	91.58	1212	8.42
Heilongjiang	14,397	13,354	92.74	1045	7.26
Jiangsu	14,397	12,307	85.47	2092	14.53
Shandong	14,397	13,460	93.48	939	6.52
Henan	14,397	12,590	87.44	1809	12.56
Hunan	14,397	13,301	92.37	1098	7.63
Guangxi	14,397	12,667	87.97	1732	12.03
Guizhou	14,397	11,922	82.80	2477	17.20

up shops as long as they can afford the rent and the shops are open almost every day, is, on average, within 0.37 km of each respondent's home. In the rural sample, the average distance is 1.91 km. Large shopping malls are also closer to urban residents, being, on average, 2.50 km away from urban respondents and 4.21 km away from rural respondents. In addition, a special economic zone, which indicates economic openness, is more likely to exist within a 2-h bus ride for an urban community. The probability of being close to a special economic zone is 53.22% for the urban sample and 38.72% for the rural sample.

Urban areas also have better infrastructure. Road conditions are, on average, better in urban areas. Paved roads (as expressed when the variable Road = 3) are available in almost all urban communities, with the urban sample observing a mean of 2.87. Urban residents are also more likely to have timely access to provincial daily newspapers. On average, 65.59% of urban respondents are able to obtain provincial daily newspapers on the day of publication, whereas only 35.84% are able to do so in rural areas. Urban respondents also have more types of transportation, with public transport such as buses and trains. A reliable power supply is available in most urban areas. In contrast, rural areas, on average, experience 1 h of power outage per day.

Finally, the competitiveness index for government administration is obtained from the China Regional Competitiveness Development Report (Xiao 2006) for each province in our sample, spanning from 1985 to 2005. This is used to evaluate government administrative performance across four areas: government expenditure, fiscal policy, government efficiency, and social equality and safety. The competitiveness index for government administration across all provinces in our sample has a mean of 48.65, with a standard deviation of 8.47.

6 Estimation results

Table 5 reports the estimation results, as well as the marginal effects of each variable at mean level, of the whole sample. After controlling for various personal and community characteristics, a difference in self-employment likelihood remains between rural and urban areas. For rural residents, the probability of being self-employed full-time is 8.19 percentage points lower than that of urban residents, while the likelihood of being self-employed part-time is 1.41 percentage points

higher than its urban counterpart. Both estimates are statistically significant at the 1% level. The results suggest that, in addition to some possibly omitted variables (e.g., the psychological characteristics of individuals, or the tendency to migration), the heterogeneity of some factors contributes to regional differences.

Tables 6, 7, and 8 present the estimation results of the rural sample. The results of the urban sample are illustrated in Tables 9, 10, and 11. All MNL estimations are verified as independent of irrelevant alternatives by the Hausman test. Marginal effect estimations are also included in Tables 6, 7, and 10. The results generally support our hypotheses.

The estimation results support H1: factors have the same sign in both urban and rural areas if their functions are not influenced by differences between rural and urban areas.

In H1.1, we propound that the likelihood of being self-employed increases if an individual is married. The results show that marriage impacts on entrepreneurial choices positively in both rural and urban areas. It supports the argument that, *ceteris paribus*, married respondents can more easily access information and financial resources than single respondents. In addition, given the efficiency of the marriage market, controlling for all other factors, single respondents beyond a certain age appear to have some disadvantages compared to their married counterparts.

H1.2 states that the influence pattern of educational attainment would be similar in rural and urban areas. We find that the relationship of education to both full-time and part-time self-employment is concave, with different turning points in two areas. In rural areas, both the linear term and quadratic term of the education variable are statistically significant at the 1% level for full-time self-employment. For part-time self-employment, estimations of the linear and quadratic terms of the education variable are statistically significant at the 10 and 5% levels, respectively. In urban samples, the pseudo *R*-square improves after we include the quadratic term, which remains statistically significant at the 1% level in all estimations. These results indicate that an individual is more likely to engage in self-employment before a certain level of education is achieved. Individuals who achieve high educational attainment are more likely to be professionals with a decent salary and are less likely to be self-employed.

With respect to H1.3, expenditures on weddings and gifts also have a positive and significant influence on

Table 5 MNL model regression for the whole sample

	(1)		Marginal effect at mean		
	Full-time Base group: wage work	Part-time	Wage work	Full-time	Part-time
Education	0.2860*** 0.0323	0.1380*** 0.0470	-0.0237*** 0.0025	0.0208*** 0.0023	0.0029** 0.0012
Education square	-0.0223*** 0.0019	-0.0133*** 0.0030	0.0019*** 0.0001	-0.0016*** 0.0001	-0.0003*** 0.0001
Experience	-0.0054 0.0091	0.0211 0.0157	-0.0001 0.0008	-0.0004 0.0007	0.0005 0.0004
Experience square	-0.0001 0.0001	-0.0008*** 0.0003	0.00003** 0.00001	0.00001 0.00001	-0.00002*** 0.00001
Gender	0.2933*** 0.0614	0.8247*** 0.1031	-0.0400*** 0.0051	0.0198*** 0.0045	0.0202*** 0.0026
Marriage	0.6720*** 0.1144	1.3421*** 0.2045	-0.0638*** 0.0066	0.0403*** 0.0060	0.0235*** 0.0027
House	0.0933 0.1040	0.3531* 0.2114	-0.0137* 0.0082	0.0061 0.0072	0.0077* 0.0041
Gift	0.1238*** 0.0321	0.0763 0.0509	-0.0107*** 0.0028	0.0090*** 0.0024	0.0017 0.0013
Village	-0.8925*** 0.0803	0.5510*** 0.1711	0.0678*** 0.0092	-0.0819*** 0.0087	0.0141*** 0.0032
Ave. wage	0.0167** 0.0078	0.0060 0.0118	-0.0013** 0.0006	0.0012** 0.0006	0.0001 0.0003
Government	-0.0131 0.0091	-0.0019 0.0148	0.0010 0.0008	-0.0010 0.0007	-0.00002 0.0004
Self. percentage	0.0014 0.0021	-0.0223*** 0.0086	0.0004* 0.0003	0.0002 0.0002	-0.0006*** 0.0002
Priv. percentage	0.0242*** 0.0065	0.0286** 0.0145	-0.0024*** 0.0006	0.0017*** 0.0005	0.0007* 0.0004
Pop. density	-0.0386*** 0.0138	-0.0223 0.0251	0.0033*** 0.0012	-0.0028*** 0.0010	-0.0005 0.0006
Pop. density square	0.0008** 0.0003	0.0009 0.0006	-0.0001*** 0.00003	0.0001** 0.00002	0.00002 0.00001
Open	-0.3492*** 0.0642	-0.3427*** 0.1116	0.0324*** 0.0053	-0.0246*** 0.0046	-0.0078*** 0.0027
Ave. day	0.2811 0.1972	-0.2760 0.2434	-0.0137 0.0156	0.0213 0.0145	-0.0076 0.0061
Ave. dis_f	-0.0624*** 0.0187	0.0233 0.0201	0.0039*** 0.0014	-0.0047*** 0.0014	0.0007 0.0005
Ave. dis_l	0.0050 0.0073	0.0208** 0.0083	-0.0008 0.0006	0.0003 0.0005	0.0005** 0.0002
Road	0.0275 0.0474	-0.0208 0.0617	-0.0015 0.0038	0.0021 0.0035	-0.0006 0.0016
Newspaper	0.3571*** 0.0678	0.1931* 0.1110	-0.0307*** 0.0059	0.0265*** 0.0052	0.0042 0.0029

Table 5 (continued)

	(1)		Marginal effect at mean		
	Full-time Base group: wage work	Part-time	Wage work	Full-time	Part-time
Electricity	0.4840*** 0.1710	0.0294 0.1524	-0.0354*** 0.0129	0.0357*** 0.0125	-0.0003 0.0039
Bus stop	0.0458 0.0665	-0.0296 0.1026	-0.0026 0.0055	0.0034 0.0049	-0.0008 0.0026
Train station	0.0381 0.0726	-0.0787 0.1301	-0.0010 0.0063	0.0030 0.0055	-0.0020 0.0031
1997	0.2750*** 0.1045	-0.0980 0.1573	-0.0190** 0.0094	0.0220** 0.0088	-0.0030 0.0037
2000	0.1609 0.0999	-0.3721** 0.1458	-0.0041 0.0084	0.0130* 0.0079	-0.0090*** 0.0031
2004	0.6421*** 0.1137	0.4036** 0.1776	-0.0654*** 0.0130	0.0558*** 0.0119	0.0096* 0.0056
2006	0.9376*** 0.1229	0.2488 0.2128	-0.0970*** 0.0166	0.0933*** 0.0159	0.0037 0.0059
Liaoning	0.5111** 0.2008	0.8543*** 0.3064	-0.0699*** 0.0236	0.0415** 0.0204	0.0284* 0.0146
Heilongjiang	-0.4732** 0.1854	0.0035 0.2913	0.0286** 0.0122	-0.0296*** 0.0097	0.0009 0.0076
Jiangsu	0.7183*** 0.2137	0.1358 0.3424	-0.0671*** 0.0248	0.0655*** 0.0238	0.0015 0.0090
Shandong	-0.0014 0.1789	-0.5166 0.3283	0.0099 0.0142	0.0008 0.0133	-0.0107** 0.0054
Henan	0.0095 0.1375	0.9339*** 0.1912	-0.0316** 0.0131	-0.0021 0.0099	0.0337*** 0.0094
Hunan	0.4941*** 0.1357	0.1421 0.2610	-0.0455*** 0.0153	0.0431*** 0.0140	0.0024 0.0071
Guangxi	1.1343*** 0.1207	1.1380*** 0.2020	-0.1500*** 0.0178	0.1131*** 0.0167	0.0369*** 0.0104
Guizhou	0.6934*** 0.1191	0.5906*** 0.1991	-0.0756*** 0.0136	0.0600*** 0.0126	0.0155** 0.0070
Constant	-4.3284*** 0.6036	-5.8754*** 0.8423			
Observations	14,397				
Percent correctly predicted	85.43				
Pseudo R^2	0.1053				
Chi-square	1500.14				
p	0.0000				
Log likelihood	-6371.2565				
Hausman test for IIA					
$p > \chi^2$	1.0000	1.0000			

Standard deviations are presented under estimated coefficients

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

Table 6 MNL model regression for the rural sample without community variables

	(2)		Marginal effect at mean		
	Full-time Base group: wage work	Part-time	Wage work	Full-time	Part-time
Education	0.2643*** 0.0437	0.1469*** 0.0530	-0.0194*** 0.0029	0.0152*** 0.0024	0.0042** 0.0017
Education square	-0.0153*** 0.0026	-0.0122*** 0.0035	0.0012*** 0.0002	-0.0009*** 0.0001	-0.0004*** 0.0001
Experience	0.0227* 0.0121	0.0253 0.0167	-0.0021** 0.0009	0.0013* 0.0007	0.0008 0.0005
Experience square	-0.0006*** 0.0002	-0.0009*** 0.0003	0.0001*** 0.00001	-0.00004*** 0.00001	-0.00003*** 0.00001
Gender	0.5438*** 0.0784	0.8798*** 0.1078	-0.0571*** 0.0056	0.0297*** 0.0045	0.0274*** 0.0035
Marriage	0.5792*** 0.1428	1.2996*** 0.2129	-0.0577*** 0.0073	0.0276*** 0.0063	0.0300*** 0.0038
House	-0.4030** 0.1606	0.1552 0.2505	0.0226 0.0146	-0.0282** 0.0129	0.0056 0.0069
Gift	0.0774** 0.0351	0.0320 0.0558	-0.0053* 0.0029	0.0045** 0.0020	0.0009 0.0018
1997	0.2850** 0.1153	-0.0204 0.1374	-0.0167* 0.0088	0.0180** 0.0077	-0.0013 0.0044
2000	-0.0678 0.1182	-0.3117** 0.1399	0.0127 0.0078	-0.0033 0.0067	-0.0094** 0.0040
2004	0.9664*** 0.1169	0.4297*** 0.1529	-0.0882*** 0.0134	0.0758*** 0.0121	0.0124** 0.0062
2006	1.1965*** 0.1268	0.3888** 0.1827	-0.1155*** 0.0170	0.1061*** 0.0159	0.0094 0.0072
Liaoning	0.2420 0.1535	0.7944*** 0.2080	-0.0473*** 0.0154	0.0127 0.0103	0.0346*** 0.0121
Heilongjiang	-0.4939*** 0.1905	0.1783 0.2548	0.0171 0.0123	-0.0243*** 0.0076	0.0072 0.0098
Jiangsu	0.1898 0.1382	-0.0211 0.2163	-0.0107 0.0112	0.0118 0.0090	-0.0011 0.0069
Shandong	-0.5721*** 0.2066	-0.7989** 0.3587	0.0449*** 0.0100	-0.0263*** 0.0079	-0.0186*** 0.0062
Henan	-0.2639 0.1699	0.9872*** 0.1932	-0.0308** 0.0145	-0.0167** 0.0080	0.0475*** 0.0125
Hunan	0.2160 0.1663	0.1795 0.2607	-0.0190 0.0146	0.0132 0.0113	0.0057 0.0096
Guangxi	0.9260*** 0.1337	1.0349*** 0.1967	-0.1122*** 0.0172	0.0683*** 0.0135	0.0439*** 0.0122
Guizhou	0.0045 0.1496	0.6918*** 0.1955	-0.0266** 0.0126	-0.0016 0.0086	0.0281*** 0.0097
Constant	-4.2929*** 0.2907	-5.5048*** 0.4068			

Table 6 (continued)

	(2)			
	Full-time Base group: wage work	Part-time	Wage work Marginal effect at mean	Full-time Part-time
Observations	10,814			
Percent correctly predicted	87.04			
Pseudo R^2	0.0915			
Chi-square	929.0594			
p	0.0000			
Log likelihood	-4611.0470			
Hausman test for IIA				
$p > \chi^2$	1.0000	1.0000		

Standard deviations are presented under estimated coefficients

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

entrepreneurial choices in both urban and rural areas. The effect of this variable in the urban sample is triple that of the rural sample. Expenditures on weddings and gifts represent not only familial wealth but also the financial resources available to the family through social ties.

H1.4 proposes that economic openness has a negative effect on the likelihood of self-employment in both urban and rural areas. Our measure of openness is whether a special economic zone is within a 2-h bus trip of the community. In both urban and rural samples, for both part-time and full-time self-employment, economic openness has a negative effect on career choices, which is statistically significant at the 1% level. Economic openness increases the opportunity cost of being self-employed by offering more employment possibilities with attractive remuneration. This is supported by the positive and significant influence of economic openness on wage jobs.

H1.5 puts forward that a positive relationship exists between infrastructure that facilitates access to information and the propensity for becoming an entrepreneur. This is measured on the basis of whether or not the community could receive provincial daily newspapers on the day of publication. This variable affects the chance of being self-employed significantly and positively in both rural and urban areas, albeit at different significance levels.

Our results also support H2, implying that the effect of some factors can differ on the basis of their urban or rural contexts.

In H2.1, we state that gender has different influences in rural areas compared to urban areas. The estimated coefficient of gender is robust and remains positive across all estimations in the rural sample, with a significance level of 1%. This indicates that males are more likely to engage in full-time self-employment in rural areas. However, the effect is negative and not statistically significant in the urban sample. With all other factors controlled for, these results indicate that the traditional male role with regard to employment dominates in rural areas, though this is not the case in urban areas. The effects of having children under the age of 7 in a family (variable *Dep_c*) are reported in Tables 8 and 11 for the rural and the urban samples, respectively. Having children under the age of 7 has no influence on entrepreneurial choices in the urban sample. In contrast, in the rural sample, having children under the age of 7 increases the likelihood of being self-employed on part-time basis. Note that the probability of full-time self-employment is higher for males in the rural sample, with an elastic supply of labor in self-employment encouraging males to switch from wage work. In model 4 of Table 8, the likelihood of being paid-employed is reduced, while the possibility of choosing part-time self-employment is increased in rural areas. Including the gender interaction term, model 5 of Table 8 illustrates that the decrease in the percentage of respondents engaging in wage work is mainly due to the fact that more males switch from paid employment to self-employment.

Table 7 MNL model regression for the rural sample with community variables

	(3)		Wage work Marginal effect at mean	Full-time	Part-time
	Full-time Base group: wage work	Part-time			
Education	0.2619*** 0.0528	0.1207** 0.0558	-0.0166*** 0.0031	0.0128*** 0.0025	0.0038* 0.002
Education square	-0.0128*** 0.0032	-0.0088** 0.0038	0.0009*** 0.0002	-0.0006*** 0.0002	-0.0003** 0.0001
Experience	0.0338** 0.0142	0.0189 0.0173	-0.0022** 0.0009	0.0016** 0.0007	0.0006 0.0006
Experience square	-0.0008*** 0.0002	-0.0007*** 0.0003	0.0001*** 0.00001	-0.00004*** 0.00001	-0.00002*** 0.00001
Gender	0.5745*** 0.0955	0.9030*** 0.1188	-0.0574*** 0.0063	0.0266*** 0.0047	0.0308*** 0.0042
Marriage	0.4778*** 0.1639	1.3872*** 0.2268	-0.0539*** 0.0078	0.0194*** 0.0065	0.0345*** 0.0042
House	-0.7605*** 0.1766	0.0873 0.2729	0.0476*** 0.0180	-0.0524*** 0.0159	0.0048 0.0084
Gift	0.2412*** 0.0618	0.2518*** 0.0762	-0.0199*** 0.0044	0.0115*** 0.0031	0.0084*** 0.0027
Ave. wage	0.0168 0.0108	0.00001 0.0136	-0.0008 0.0007	0.0008 0.0005	-0.00003 0.0005
Government	-0.0329*** 0.0124	0.0091 0.0165	0.0013 0.0008	-0.0017*** 0.0006	0.0004 0.0006
Self. percentage	0.0162*** 0.0059	-0.0225** 0.0112	-0.00003 0.0005	0.0009*** 0.0003	-0.0008** 0.0004
Priv. percentage	0.0294* 0.0167	0.0043 0.0229	-0.0016 0.0012	0.0015* 0.0008	0.0001 0.0008
Pop. density	0.0019 0.0111	0.0315*** 0.0110	-0.0011* 0.0007	0.00004 0.0006	0.0011*** 0.0004
Open	-0.0614 0.1014	-0.3591*** 0.1333	0.0143** 0.0066	-0.0024 0.0050	-0.0119*** 0.0042
Irrigation	-0.0060*** 0.0014	0.0036** 0.0018	0.0002* 0.0001	-0.0003*** 0.0001	0.0001** 0.0001
Ave. day	0.4934* 0.2641	-0.3782 0.2779	-0.0110 0.0163	0.0253* 0.0131	-0.0143 0.0098
Ave. dis_f	-0.0269 0.0200	0.0207 0.0216	0.0006 0.0013	-0.0014 0.0010	0.0008 0.0008
Ave. dis_l	0.0137 0.0096	0.0232*** 0.0089	-0.0014** 0.0006	0.0006 0.0005	0.0008** 0.0003
Road	0.0455 0.0599	0.0223 0.0671	-0.0029 0.0038	0.0022 0.0030	0.0007 0.0024
Newspaper	0.3006*** 0.1020	0.5097*** 0.1264	-0.0340*** 0.0079	0.0147*** 0.0057	0.0193*** 0.0055
Electricity	0.2737 0.1834	-0.0159 0.1595	-0.0126 0.0105	0.0137 0.0091	-0.0011 0.0056

Table 7 (continued)

	(3)		Wage work Marginal effect at mean	Full-time	Part-time
	Full-time Base group: wage work	Part-time			
Bus stop	-0.1019	-0.0722	0.0073	-0.0050	-0.0024
	0.0991	0.1189	0.0065	0.0050	0.0042
Train station	-0.0990	-0.1854	0.0104	-0.0045	-0.0060
	0.1264	0.1583	0.0078	0.0059	0.0049
1997	0.0570	0.0587	-0.0047	0.0028	0.0020
	0.1419	0.1764	0.0095	0.0072	0.0064
2000	-0.0980	-0.2444	0.0124	-0.0044	-0.0080
	0.1422	0.1677	0.0086	0.0068	0.0053
2004	0.6945***	0.7144***	-0.0713***	0.0413***	0.0300***
	0.1560	0.1978	0.0162	0.0121	0.0111
2006	0.8070***	0.4196	-0.0681***	0.0535***	0.0146
	0.1810	0.2687	0.0200	0.0161	0.0125
Liaoning	0.9343***	1.1147***	-0.1175***	0.0607**	0.0568*
	0.2942	0.3782	0.0379	0.0278	0.0299
Heilongjiang	-0.1220	-0.0283	0.0065	-0.0057	-0.0008
	0.2758	0.3849	0.0181	0.0124	0.0133
Jiangsu	1.3362***	0.0720	-0.1002***	0.1018***	-0.0015
	0.2955	0.4057	0.0339	0.0321	0.0138
Shandong	0.5827**	-0.5776	-0.0213	0.0383	-0.0170*
	0.2951	0.4343	0.0249	0.0235	0.0091
Henan	0.0262	0.9039***	-0.0422**	-0.0011	0.0433***
	0.2040	0.2374	0.0174	0.0100	0.0148
Hunan	0.4195*	0.6981**	-0.0538**	0.0222	0.0315*
	0.2300	0.3137	0.0236	0.0154	0.0190
Guangxi	1.1925***	1.2979***	-0.1462***	0.0809***	0.0653***
	0.1866	0.2554	0.0253	0.0188	0.0199
Guizhou	0.1206	0.6846***	-0.0335**	0.0045	0.0290**
	0.1961	0.2430	0.0157	0.0102	0.0124
Constant	-3.8872***	-6.2056***			
	0.7292	0.9303			
Observations	8565				
Percent correctly predicted	86.94				
Pseudo R^2	0.1178				
Chi-square	957.22				
p	0.0000				
Log likelihood	-3583.6147				
Hausman test for IIA					
$p > \chi^2$	1.0000	1.0000			

Standard deviations are presented under estimated coefficients

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

Table 8 MNL model regression for the rural sample (child dummy)

	(4)		(5)	
	Full-time Base group: wage work	Part-time	Full-time Base group: wage work	Part-time
Education	0.2614*** 0.0528	0.1213** 0.0558	0.2609*** 0.0528	0.1219** 0.0558
Education square	-0.0128*** 0.0032	-0.0087** 0.0038	-0.0127*** 0.0032	-0.0088** 0.0038
Experience	0.0358** 0.0143	0.0228 0.0174	0.0365** 0.0143	0.0231 0.0174
Experience square	-0.0008*** 0.0002	-0.0008*** 0.0003	-0.0008*** 0.0002	-0.0008*** 0.0003
Gender	0.5730*** 0.0955	0.9010*** 0.1189	0.4768*** 0.0998	0.8414*** 0.1277
Marriage	0.4300** 0.1684	1.2892*** 0.2329	0.4176** 0.1685	1.2815*** 0.2330
House	-0.7574*** 0.1766	0.0925 0.2729	-0.7583*** 0.1769	0.0916 0.2730
Gift	0.2441*** 0.0619	0.2574*** 0.0764	0.2442*** 0.0617	0.2568*** 0.0763
Dep_c	0.1821 0.1510	0.2964* 0.1557	-0.4846* 0.2927	0.0412 0.2710
Gender_Dep_c			0.9601*** 0.3275	0.3907 0.3107
Ave. wage	0.0175 0.0109	0.0014 0.0137	0.0184* 0.0109	0.0019 0.0137
Government	-0.0327*** 0.0124	0.0096 0.0165	-0.0327*** 0.0124	0.0095 0.0166
Self. percentage	0.0161*** 0.0059	-0.0222** 0.0111	0.0162*** 0.0059	-0.0222** 0.0111
Priv. percentage	0.0306* 0.0168	0.0059 0.0229	0.0302* 0.0168	0.0057 0.0229
Pop. density	0.0016 0.0111	0.0309*** 0.0110	0.0015 0.0111	0.0309*** 0.0110
Open	-0.0627 0.1014	-0.3575*** 0.1334	-0.0633 0.1014	-0.3584*** 0.1334
Irrigation	-0.0060*** 0.0014	0.0036** 0.0018	-0.0060*** 0.0014	0.0036** 0.0018
Ave. day	0.4931* 0.2643	-0.3895 0.2782	0.4965* 0.2644	-0.3868 0.2783
Ave. dis_f	-0.0276 0.0200	0.0206 0.0216	-0.0272 0.0201	0.0208 0.0216
Ave. dis_l	0.0134 0.0096	0.0226** 0.0090	0.0133 0.0096	0.0226** 0.0090
Road	0.0450 0.0600	0.0211 0.0672	0.0451 0.0600	0.0215 0.0673

Table 8 (continued)

	(4)		(5)	
	Full-time Base group: wage work	Part-time	Full-time Base group: wage work	Part-time
Newspaper	0.3006*** 0.1019	0.5088*** 0.1262	0.2984*** 0.1020	0.5080*** 0.1263
Other variables: controlled				
Constant	-5.2293*** 0.5429	-5.8655*** 0.5979	-5.1793*** 0.5438	-5.8309*** 0.5988
Observations	8565		8565	
Perc. correctly predicted	86.92		86.96	
Pseudo R^2	0.1184		0.1197	
Chi-square	961.76		972.47	
p	0.0000		0.0000	
Log likelihood	-3581.3440		-3575.9873	
Hausman test for IIA				
$p > \chi^2$	1.0000	1.0000	1.0000	1.0000

Standard deviations are presented under estimated coefficients

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

In H2.2, we suggest that the effect of career experience differs between the urban and the rural samples. Our results show that a nonlinear, inverted U-shaped relationship exists between experience and entrepreneurial choices in the rural sample; however, the relationship is linear and negatively correlated in the urban sample. This supports our hypothesis. For full-time self-employment, the linear term and quadratic term are significant. For part-time self-employment, we only observe a negatively significant quadratic term. The results of the urban sample support a common belief regarding self-employment: while having had a longer career initially facilitates wealth accumulation, the opportunity cost of switching jobs increases as more work experience is obtained. Rural residents are likely to need more time in paid employment to accumulate the financial and/or human capital needed to start their own business.

H2.3 suggests that family ownership of real estate lowers the propensity for entrepreneurship in rural areas. The results support this hypothesis—the ownership of real estate has a significantly negative relationship to self-employment in rural areas and a significantly positive one for urban areas. It is because, as aforementioned, during our sample period, rural residents were not able to use property as collateral for loans.

H2.4 suggests that population density has an opposite influence on entrepreneurial choices in rural areas as compared to urban areas. The results support our hypothesis. In the rural sample (Table 6), population density has a positive influence on part-time self-employment but has no impact on entrepreneurial choices in the urban sample. We estimate the effect of population density on the entire sample in Table 5 and find that a significant convex relationship exists for full-time self-employment, while a marginally significant concave relationship exists for wage work.

H2.5 proposes that the influence of the management efficiency of government on entrepreneurial choices varies between rural and urban areas. Our estimation results support this. In the rural sample, the index demonstrates a significantly negative relationship to full-time self-employment at the 1% level. In contrast, the estimated coefficient is marginally positive at the 10% level in the urban sample. A sound institutional environment attracts investment and helps explore entrepreneurial opportunities, which attract and retain rural residents in urban areas (Huang 2008).

Finally, a unique rural variable, the percentage of irrigated farmland in the community, negatively influences full-time self-employment but positively influences part-time self-employment. Since community

Table 9 Probit model regression for the urban sample without community variables

	(6)	(7)	(8)
	1, self-employment;0, wage work		
	Base group: wage work		
Education	-0.1177*** 0.0097	0.0143 0.0267	0.0175 0.0286
Education square		-0.0076*** 0.0014	-0.0077*** 0.0015
Experience	-0.0151*** 0.0030	-0.0101*** 0.0031	-0.0125 0.0081
Experience square			0.00004 0.0001
Gender	0.0264 0.0533	-0.0100 0.0540	-0.0096 0.0540
Marriage	0.4810*** 0.0903	0.4227*** 0.0916	0.4389*** 0.1051
House	0.2717*** 0.0704	0.2917*** 0.0709	0.2912*** 0.0709
Gift	0.1271*** 0.0443	0.1404*** 0.0448	0.1401*** 0.0448
1997	0.3663*** 0.0833	0.3420*** 0.0833	0.3429*** 0.0833
2000	0.4143*** 0.0837	0.3801*** 0.0841	0.3816*** 0.0842
2004	0.2879*** 0.0865	0.2583*** 0.0869	0.2592*** 0.0869
2006	0.6344*** 0.0949	0.6107*** 0.0954	0.6132*** 0.0957
Liaoning	0.0393 0.1538	-0.0133 0.1564	-0.0133 0.1564
Heilongjiang	-0.4134*** 0.1491	-0.4043*** 0.1512	-0.4042*** 0.1512
Jiangsu	0.3616*** 0.1112	0.3167*** 0.1118	0.3149*** 0.1119
Shandong	0.3749*** 0.1212	0.3211*** 0.1221	0.3199*** 0.1222
Henan	0.1857* 0.1098	0.1865* 0.1103	0.1859* 0.1103
Hunan	0.6241*** 0.1116	0.5529*** 0.1128	0.5535*** 0.1128
Guangxi	0.7693*** 0.1073	0.6969*** 0.1083	0.6966*** 0.1083
Guizhou	0.8157*** 0.0986	0.7721*** 0.0993	0.7724*** 0.0993
Constant	-0.8129***	-1.2821***	-1.2823***

Table 9 (continued)

	(6)	(7)	(8)
	1, self-employment;0, wage work		
	Base group: wage work		
Observations	0.1595 3583	0.1847 3583	0.1848 3583
Percent correctly predicted	81.69	81.44	81.44
Pseudo R^2	0.1408	0.1491	0.1491
Chi-square	484.7678	513.3533	513.4516
p	0.0000	0.0000	0.0000
Log likelihood	-1479.6135	-1465.3208	-1465.2716

Standard deviations are presented under estimated coefficients

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

infrastructure is mainly self-financed by rural residents, the percentage of irrigated farmland illustrates farming conditions and the economic development of the community. The opportunity cost of full-time self-employment is higher in rural areas, where agriculture generates relatively more income. However, part-time self-employment is more popular in areas where economic prosperity generates entrepreneurial activities.

7 Discussion

7.1 Contributions

This paper investigates the effect of urban and rural environments and personal factors on entrepreneurial choices in China using CHNS data. We make three main contributions. First, we contribute to the literature on the relationship between institutional environments and entrepreneurial choices by supporting a perspective that the effect of factors depend on institutional environment. Researchers have previously examined the regulatory, normative, and cognitive dimensions of institutional environment. Baumol (1990) analyzes the influence of institutional environment on the nature of an entrepreneur. Aldrich and Fiol (1994) and Fadahunsi and Rosa (2002) focus on legitimacy. Bruton et al. (2010) review the literature on institutional settings and institutional entrepreneurs. This paper provides another explanation for regional differences in entrepreneurship: institutional environments can affect the impact

Table 10 Probit model regression for the urban sample with community variables

	(9)		(10)	
	Base group: wage work		Base group: wage work	
	Probit	Marginal	Probit	Marginal
Education	0.0151	0.0033	0.0137	0.0030
	0.0271	0.0059	0.0272	0.0059
Education square	-0.0074***	-0.0016***	-0.0074***	-0.0016***
	0.0015	0.0003	0.0015	0.0003
Experience	-0.0096***	-0.0021***	-0.0097***	-0.0021***
	0.0031	0.0007	0.0032	0.0007
Gender	-0.0123	-0.0027	-0.0149	-0.0032
	0.0558	0.0122	0.0559	0.0122
Marriage	0.4280***	0.0790***	0.4322***	0.0794***
	0.0925	0.0142	0.0926	0.0142
House	0.2323***	0.0472***	0.2255***	0.0458***
	0.0725	0.0137	0.0729	0.0138
Gift	0.1438***	0.0313***	0.1392***	0.0302***
	0.0453	0.0098	0.0455	0.0099
Ave. wage	-0.0008	-0.0002	-0.0021	-0.0005
	0.0101	0.0022	0.0103	0.0022
Government	0.0162*	0.0035*	0.0169*	0.0037*
	0.0094	0.0020	0.0094	0.0020
Self. percentage	0.0009	0.0002	0.0006	0.0001
	0.0015	0.0003	0.0015	0.0003
Priv. percentage	0.0074	0.0016	0.0092*	0.0020*
	0.0047	0.0010	0.0048	0.0010
Pop. density	-0.0037	-0.0008	-0.0174	-0.0038
	0.0035	0.0008	0.0113	0.0024
Pop. density square			0.0003	0.0001
			0.0002	0.0001
Open	-0.3573***	-0.0789***	-0.3512***	-0.0773***
	0.0645	0.0143	0.0649	0.0144
Ave. day	0.0592	0.0129	0.5926	0.1287
	0.0420	0.0091	0.4239	0.0919
Ave. dis_f	-0.0118	-0.0026	-0.0221	-0.0048
	0.0584	0.0127	0.0610	0.0132
Ave. dis_l	0.0082	0.0018	0.0136	0.0030
	0.0105	0.0023	0.0107	0.0023
Road	-0.0654	-0.0142	-0.0788	-0.0171
	0.0798	0.0174	0.0799	0.0173
Newspaper	0.1110*	0.0237*	0.1307**	0.0277**
	0.0652	0.0137	0.0659	0.0137
Electricity	-0.0122	-0.0026	-0.0408	-0.0089
	0.0666	0.0145	0.6682	0.1451
Bus stop	0.0942	0.0200	0.0975	0.0207

Table 10 (continued)

	(9)		(10)	
	Base group: wage work		Base group: wage work	
	Probit	Marginal	Probit	Marginal
	0.0696	0.0145	0.0697	0.0144
Train station	0.0745	0.0166	0.0630	0.0139
	0.0707	0.0161	0.0711	0.0160
1997	0.4254***	0.1076***	0.4263***	0.1075***
	0.1087	0.0311	0.1091	0.0311
2000	0.4617***	0.1154***	0.5015***	0.1264***
	0.1019	0.0285	0.1040	0.0295
2004	0.3622***	0.0878***	0.4202***	0.1034***
	0.1194	0.0317	0.1211	0.0330
2006	0.6430***	0.1734***	0.6866***	0.1870***
	0.1253	0.0395	0.1277	0.0408
Liaoning	-0.1291	-0.0264	-0.1515	-0.0305
	0.2181	0.0417	0.2191	0.0408
Heilongjiang	-0.6017***	-0.0992***	-0.6475***	-0.1041***
	0.1789	0.0208	0.1816	0.0199
Jiangsu	0.1391	0.0321	0.1361	0.0313
	0.2164	0.0528	0.2181	0.0529
Shandong	0.2799*	0.0690	0.1803	0.0425
	0.1597	0.0439	0.1728	0.0440
Henan	0.3198***	0.0787**	0.3144***	0.0771**
	0.1189	0.0325	0.1190	0.0324
Hunan	0.6597***	0.1850***	0.6495***	0.1812***
	0.1324	0.0445	0.1327	0.0443
Guangxi	0.8626***	0.2544***	0.8651***	0.2550***
	0.1252	0.0446	0.1253	0.0446
Guizhou	0.8789***	0.2502***	0.8559***	0.2418***
	0.1071	0.0362	0.1081	0.0363
Constant	-2.0737		-2.2270	
	1.6611		1.6644	
Observations	3583		3583	
Percent correctly predicted	81.89		81.75	
Pseudo R^2	0.1615		0.1642	
Chi-square	557.26		565.46	
p	0.0000		0.0000	
Log likelihood	-1446.2445		-1439.2694	

Standard deviations are presented under estimated coefficients

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

of factors that help determine the propensity to undertake entrepreneurial activities to be positive or negative.

Secondly, this paper enriches investigation into regional differences in entrepreneurship in China. The development of a private sector has strongly supported

Table 11 Probit model regression for the urban sample on gender issues

	(11)	(12)
	1, self-employment;0, wage work	
	Base group: wage work	
Education	0.0148	0.0148
	0.0273	0.0273
Education square	-0.0074***	-0.0074***
	0.0015	0.0015
Experience	-0.0091***	-0.0091***
	0.0032	0.0032
Gender	-0.0167	-0.0273
	0.0560	0.0582
Marriage	0.4127***	0.4113***
	0.0951	0.0951
House	0.2263***	0.2268***
	0.0729	0.0729
Gift	0.1404***	0.1407***
	0.0455	0.0455
Dep_c	0.0973	0.0274
	0.1074	0.1507
Gender_Dep_c		0.1329
		0.1990
Government	0.0168*	0.0168*
	0.0094	0.0094
Self. percentage	0.0006	0.0006
	0.0015	0.0015
Priv. percentage	0.0088*	0.0088*
	0.0048	0.0048
Pop. density	-0.0173	-0.0172
	0.0113	0.0113
Pop. density square	0.0003	0.0003
	0.0002	0.0002
Open	-0.3505***	-0.3508***
	0.0649	0.0649
Newspaper	0.1303**	0.1309**
	0.0659	0.0659
Other variables	Controlled	
Constant	-2.2571	-2.2501
	1.6639	1.6631
Observations	3583	3583
% correctly predicted	81.83	81.80
Pseudo R ²	0.1644	0.1646
Chi-square	566.27	566.72
p	0.0000	0.0000
Log likelihood	-1438.8615	-1438.6383

Standard deviations are presented under estimated coefficients

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

China's recent economic growth (Huang 2008). Ample research has investigated the strategies adopted by Chinese entrepreneurs to start from nothing and to achieve success in an environment where standards differ from international practices (Ahlstrom et al. 2008; Chen et al. 2012). The reforms in China provide opportunities to investigate important issues related to the emergence of a full-time entrepreneur: liquidity constraints (Li and Wu 2014; Wang 2012), political stability (Lu and Tao 2010), gender (Deng et al. 2010; Wei and Zhang 2011), new institutional arrangements (Ahlstrom and Bruton 2002; Troilo and Zhang 2012), migration (Démurger and Xu 2011; Zhao 2002), and so on. This paper extends the sample to a more representative data set, which covers both full-time and part-time self-employment in China.

Finally, suggestions for accelerating the development of entrepreneurship in China are given based on our results. Since whether the impact of a factor is positive or negative might depend on the institutional environment, policymakers should make institutional arrangements to encourage entrepreneurship. These arrangements might include alleviating rural liquidity constraints, providing further fiscal support for rural infrastructure and education, dismantling the *Hukou* system and eliminating its associated unequal allocation of educational and medical resources, and improving the social status of women in rural areas by providing public services in childcare, financial resources, and social pensions.

7.2 Limitations and future research directions

Personal psychological characteristics are important for entrepreneurial choices (Beugelsdijk and Noorderhaven 2005; Caliendo et al. 2014; Grichnik et al. 2010; Shane et al. 2003). Their effects on the decision of self-employment should be discussed. If entrepreneurs can be shown to be different from people of other occupations, this will lead to a debate between opportunity creation theory and opportunity discovery theory (Alvarez and Barney 2013).

The issue of self-selection in internal migration is not considered here, since land arrangements and rural taxation are major determinants of migration in China (Zhao 1999). To the best of our knowledge, no panel data tracking the migration of individuals over our sample period currently exists. However, regional differences in entrepreneurship in China beyond the sample

period of this paper may have evolved. As regulations on agricultural tax were rescinded in 2006,¹ and experiments on the collateralizing of contracted management right to rural land were carried out in 2008,² motivations for migration may have changed. Therefore, to address the problem of self-selection, further improvements in the data, such as using panel data, and in econometric methods, are needed in similar future studies.

8 Conclusion

Does the same factor impact on the likelihood to be self-employed similarly across different institutional environment? Although the literature provides causality investigation into factors such as housing (Li and Wu 2014; Wang 2012), skills (Lazear 2004; Stuetzer et al. 2013), and insurance (Liu and Zhang 2017), the answer still depends on how this factor is integrated with other institutional arrangements. Among the non-psychological personal characteristics examined in this paper, marriage, education, money spent on weddings and gifts, economic openness, and access to information have effects on entrepreneurial choices that are not influenced by differing institutional arrangements between rural and urban areas. However, family ownership of property, entrepreneurial experience, gender, population density, the management efficiency of government, and the development of private businesses in the local community have different effects on entrepreneurial choices in urban, as compared to rural, areas. To encourage entrepreneurship, attention should be paid to how the impact of these factors varies under different contexts. Development and reform of financial institutions should be accelerated to improve liquidity, and the pace of urbanization should be increased to improve the commercial environment and to encourage entrepreneurial activities. Finally, infrastructure that facilitates information transfer should be further developed to stimulate entrepreneurial activities in China.

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¹ Order No. 46 of the President of the People's Republic of China

² Opinions of the People's Bank of China and the China Banking Regulatory Commission on Promoting the Innovation in Financial Products and Service Modes in Rural Areas [Effective] (No. 295 [2008] of the People's Bank of China)

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