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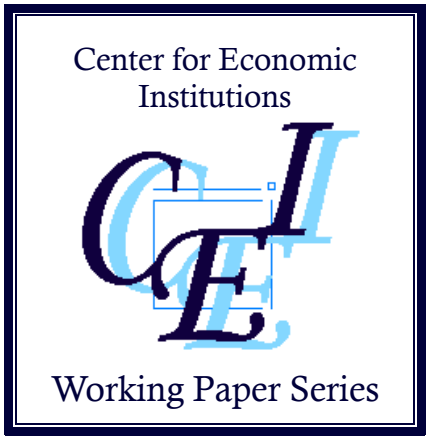

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Economic Transition and the Determinants of Self-employment in Urban China: 2007-2013

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Abstract

This paper conducts two hypotheses testing and provides evidence on the determinants of self-employment for local urban residents and migrants in urban China. Using CHIP2007 and CHIP2013, the employment status is divided into four categories—self-employed employers, own-account workers, employees, and the unemployed. Several major conclusions emerge. First, utilizing the imputed wage premiums, the business creation hypothesis is rejected for both the local urban residents and migrants groups in 2007. However, in 2013, the business creation hypothesis is supported when a worker choice to become a self-employed employer. Whereas the influences of wage premiums on the probability of becoming an own-account worker are negatively significant for both the local urban residents group and the migrants group, so the business creation hypothesis is rejected when a worker choice to become an own-account worker. Second, the choice to become a self-employed employer for the local urban residents group, and the choice to become an own-account worker for the migrants group in the initial economy reform period can gain more benefit, so the business creation hypothesis is supported for older generation group, whereas this hypothesis is rejected for the younger generation group for both the local urban residents and migrants groups.

Keywords: self-employed employer, own-account worker, business creation hypothesis, disguised unemployment hypothesis, urban China
JEL classifications*:* J23; J31; O17

1 Introduction

The self-employed sector is a representative informal sector of the employment market, and it influence on the income inequality as noted in previous studies[1]. Transition economists believe the rise of self-employment to be a sign of the growing importance

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of markets (Hanley 2000; Gerber 2001; Catherine *et al.* 2005; Dimova and Gang 2007; Jackson and Mach 2009). According to the dualism theory in development economics, in the prior period of economic development, there exist surplus labors in traditional sector (e.g., agriculture industry sector), when modern sector (e.g., manufacture industry sector) offer wage closed or a little more than subsistence wage level, migration from the rural region to the urban region will occur until the economy pass the Lewis's turning point (Lewis 1954). Todarro (1969), Harris and Todarro (1970) developed Lewis model and pointed out that migrants expect the high wage of modern sector in urban market, so when he doesn't find the job in the formal sector immediately, he always worked in the informal sector (such as self-employed sector) to wait (or do a job search) for the formal sector job. ILO (1972) indicated that working in the informal sector also can contribute economic development for developing countries.

Along with the economic transition and economic development in China, the number of self-employed workers[2] in urban China increased from 150,000 in 1978 to 21.36 million in 2000, before further increasing to 52.27 million in 2011 (NBS 2012). Why was there a large change in the size of the self-employed sector in urban China during the economic transition period? There are two hypotheses about self-employment discussed in previous studies. One is the "disguised unemployment hypothesis," which is indicated in the dualism theory described as the above. Migrants to the self-employment sector can be explained by this hypothesis, as in the case of workers in SOEs who lost their jobs because of SOE reconstruction. Along with the transition from a planned to a market economy, the government enforced ownership reform of state-owned enterprises (SOEs) since the 1990s, a section of employees with urban registration in the SOEs became laid-off workers and some of them re-employed as self-employed workers in order to make a living (Knight and Song 1999; Cai, Du, and Wang 2005; Haggard and Huang 2008). Considering the above, self-employment may result from forced recourse to the informal sector, in which the individual's activities and wage slightly differ from what they would be if the individual were unemployed. It is thought that self-employed workers barely make a living from

working, receiving lower wages and working longer hours than those in the formal sector. Conversely, self-employed workers may also be successful business owners who create new business opportunities and many innovative new products ("business creation hypothesis"). For example, along with ownership reform progress, a part of communist party members or cadres left SOEs to become owners of private firms and started new businesses, and it has been pointed out that such social capital positively affects the premium that may be associated with self-employment (Wu 2006; Yueh 2009a, 2009b)[3] .

As a result, a high percentage of self-employed workers may reflect an environment that encourages risk-taking, business creation, and market development ("business creation hypothesis") , or it may be a result of the lack of jobs in the formal sector in which wages are set just above the market-clearing level ("disguised unemployment hypothesis").

Which hypothesis can explain self-employment in urban China? In this paper, we provide some evidence to answer this question. In the previous empirical studies on this issue, although Earle and Sakova(2000), Hanley (2000) and Dimova and Gang(2007) utilized micro-data of Central and Eastern European economic transition countries to test these two hypotheses, Ma (2016), Ma and Deng (2016) test these two hypotheses for the local urban residents group and migrants group in China using the 2007 Chinese Household Income Project Survey data (CHIP2007), an empirical study on the comparison between local urban residents and migrants, and that between two periods has not been conducted. Thus, one of the purposes of this study is to test the hypotheses for these two groups in China using CHIP2007 and the latest survey data—the 2013 Chinese Household Income Project Survey (CHIP2013).

This paper is structured as follows. Part II reviews the literature, and Part III describes estimate methods, including introduction to the survey data and models. Part IV states descriptive statistics and estimated results, and Part V presents the main conclusions.

2 Literature Review

First, for the determinants of self-employment, it is indicated that individual attributes should affect the choice to become a self-employed worker. For example, gender, human capital, and family background are often used as control variables in previous studies (e.g., Borjas 1986; Amit *et al.* 1990; Evans and Leighton 1989; Bruce 1999; Hamilton 2000; Dunn and Holtz-Eakin 2000; Zhang and Pan 2012). In addition, Evans and Jovanovic (1989), Lentz and Laband（1990), Holtz-Eakin *et al.* (1994), Dunn and Holtz-Eakin (2000) indicated that financial constraints also affect the entry to the self-employed. Reviewing empirical studies on the determinants of self-employment in China beyond the factors of human capital, family background, and liquidity constraints, the effects of party membership and social capital are also pointed out (Wu 2006; Yueh 2009a, 2009b; Zhang and Zhao 2015).

Regarding the determinants of the self-employment in economic transition countries, Earle and Sakova (2000), Hanley (2000) and Dimova and Gang (2007) pointed out the two previous hypotheses ("disguised unemployment hypothesis" and "business creation hypothesis") and tested them for Central and Eastern European transition countries. Earle and Sakova (2000) showed that for both own-account workers and self-employed employers in almost every country (Bulgary, Czech Republic, Hungary, Poland, Russia and Slovakia), the probabilities are estimated to be negatively affected by wage differentials between own-account workers and employees and positively affected by wage differentials between the self-employed employer and employees. This corroborated the disguised unemployment hypothesis. Hanley (2000) also tested these hypotheses to estimate wage differentials between self-employed employers, own-account workers, and employees, pointing out that the disguised unemployment hypothesis is supported by the observations for the Czech Republic, Poland, and Slovakia. Ma (2016) revealed that unemployment hypothesis is rejected, and disguised unemployment hypothesis is supported for local urban residents group in China. In addition, Ma and Deng (2016) conducted an empirical study and indicated that the disguised unemployment hypothesis is also supported for migrants group in

China.

The main features of this study are the following. First, we utilized the model proposed by Earle and Sakova (2000) to verify the business creation and disguised unemployment hypotheses for the entire workforce in urban China—either local urban residents or migrants—and compare the difference of determinants of entry to self-employment between these two groups. Second, although Ma (2016) and Ma and Deng (2016) conducted tests using CHIP2007, which was carried out before the global financial crisis (economic downturn precipitated by the Lehman Brothers' bankruptcy in 2008), named the Roman shock, we test these two hypotheses using CHIP2007 and CHIP2013 to consider the change of determinants of self-employment before and after the financial crisis. It is believed that the 2008 global financial crisis affected the foreign trade in China. Thus, it might have influenced the labor demand for low-skilled workers and caused more employees to enter into self-employment owing to desperation. Third, the determinants of self-employment maybe differ according to the age group. We use subsamples of groups of those less than 50 years old and those aged 50 and over to estimate the age effect for local urban residents and migrants groups, and compare the difference of age effects for these two groups. Fourth, there exist huge regional differences in urban China, and that the level of economic development and labor demand and supply are different by region. Thus, we also test the hypotheses on a regional basis and compare these regional differentials.

3 Methodology and Data

3.1 Models

Firstly, to explicate the determinants of the self-employed in urban China, the employment status probability function is estimated using a multinomial logit model, which is represents in Eq. (1). The explained variable takes on one value for four categories of employment status (self-employed employer, own-account worker, employee, and the unemployed). Here, referring Earle and Sakova (2000), Hanley

(2000), we defined own-account workers are those who work in small firms (or unit) which only him (herself) or no-paid family workers work in, self-employed employees are those who work in small firms with workers less than 8 and they are the owners of these small firms. The reference category is the employee group.

$$\Pr(Y_i = n) = \frac{\exp(a_n + \beta_{Xn} X_{ni})}{\sum_{m=1}^{r} \exp(a_m + \beta_{Xm} X_{mi})} \qquad (1)$$

In Eq.(1), i denotes workers, $m(m = 1, n...r)$ denotes employment status as the above. $\Pr(Y_i = n)$ indicates probability of one kind of employment status, X are factors affecting the employment status probability, β are the estimated coefficients, and α is a constant.

Then we used two kinds of methods to test the "disguised unemployment hypothesis" and "business creation hypothesis". The one is a comparison of average wage levels of self-employed employer group, own-account worker group and employee group (Hanley 2000). For example, holding the other factors (such as human capitals) constant, if the average wage level of own-account worker group is lower greatly than employee group, it shows that own-account workers are nearly the disguised unemployed, and labor market is segmented. In order to gain these imputed wage, wage functions by different employment status groups are estimated. Here, Madala (1983) model is used to deal with the sample selection bias problem, which has been shown in Eqs. (2.1)~(2.3).

Wage functions estimated by OLS model is expressed as Eq. (2.1).

$$LnWage_i = b + \gamma_{Emp} Emp_i + \gamma_H H_i + u_i \qquad (2.1)$$

In Eq.(2.1), i denotes workers, and $LnWage$ indicates the dependent variable (as the logarithm of wage rate). Emp is an index indicating employment status (self-employed employer, own-account worker and employee), H are factors affecting

earnings. γ_{Emp} and γ_H are the estimated coefficients. Further, α is a constant and u is the error term.

Considering the selection bias problem in Eq.(2.1), the selection bias corrected wage function model is proposed (Maddala 1983). Eq.(2.2) expresses the probability of employment status using multinomial logit model. For example, the probability to become a self-employed employer is expressed as $\Pr(Y_i^* = 1)$, and the other probability (such as employee, own-account worker, the unemployed) is expressed as $\Pr(Y_i^* \neq 1)$. X are factors identical to those expressed in Eqs. (2.1), Z is used as an identification variable[4]. Using the estimated results of the distribution function and the density function by Eq.(2.2), selectivity items ($\lambda = \phi(\beta Z)/\Phi(\beta Z)$) are calculated. The corrected wage functions expressed by Eq. (2.3) can be estimated using these selectivity items.

$$
\begin{aligned}
&Y_{mi}^{\ *} = a_m + \beta_{Xm} X_{mi} + \varepsilon_{mi} \qquad (i = 1,2\cdots, N)\\
&Y^* = n \quad \text{if} \quad \beta_n X_n - \beta_m X_m > (a_m - a_n) + (\varepsilon_m - \varepsilon_n) \qquad (m \neq n)\\
&\Pr(Y_i^* = n) = \frac{\exp(a_n + \beta_{Zn} Z_{ni} + \beta_{Xn} X_{ni})}{\sum_{m=1}^{r} \exp(a_m + \beta_{Zn} Z_{mi} + \beta_m X_{mi})} \quad m(m = 1, n...r) \qquad (2.2)
\end{aligned}
$$

$$
LnWage_i = b + \gamma_{Emp} Emp_i + \gamma_X H_i + \gamma_\lambda \lambda_i + u_i \qquad (2.3)
$$

The other test is the estimation of the effects of wage premiums—wage differentials between employment status groups on the probability of employment status (Earle and Sakova 2000). We utilize a multinomial logit model shown in Eq. (3). In Eq. (3), wage premiums ($\overline{WP}$) are added as new variables, the other variables are similar with Eq (1). It is thought that higher the wage premium, higher the probability to choice the employment status. For example, when the estimated results of wage premium ("Wer/Wee") is positive significantly on the probability to become a self-employed employer, it is shown that the self-employment is a new business to gain more income and create more values (such as create new jobs for others, and new

goods), so the "business creation hypothesis" is supported. While, when the estimated results of wage premium ("Wer/Wee") is negative significantly (or insignificantly) on the probability to become a self-employed employer, it is shown that although becoming a self-employed employer can't gain more, he (she) has to choice to become a self-employed employer, it indicates that the entry to the informal sector may be an involuntary behavior, and "disguised unemployment hypothesis" is supported.

$$E(\Pr(Y_i^* = 1) = \frac{\exp(a_n + \beta_{EP}\overline{WP}_{ni} + \beta_{Zn}Z_{ni} + \beta_{Xn}X_{ni})}{\sum_{m=1}^{r}\exp(a_m + \beta_{EP}\overline{WP}_{mi} + \beta_{Zn}Z_{mi} + \beta_m X_{mi})} \quad (3)$$

3.2 Data

The 2007 and 2013 Chinese Household Income Project Surveys data (CHIP2007 and CHIP2013) are used for the analysis. These surveys were conducted by NBS (National Bureau of Statistics) and Beijing Normal University in December 2008 and 2014, including respective information about employment status and wages of the urban registration residents and migrants. Particularly, based on CHIP2007 and CHIP2013, we can distinguish self-employment status between two groups—own-account workers and self-employed employers—to test the hypotheses. In both CHIP2007 and CHIP2013 data, most of the survey items are similar. However, we can utilize both data to compare the change of determinants of entry to self-employment before and after the financial crisis. CHIP2007 and CHIP2013 covered the represented districts in China, including Beijing, Shanxi, Liaoning, Jiangsu, Anhui, Guangdong, Henan, Hubei, Sichuan, Yunnan, and Gansu. We utilize the samples in districts that are surveyed in both 2008 and 2014 to adjust the district selection bias.

From the above, the main dependent variable is an employment status category variable. The independent variables are as follows (**Table 1** shows sample statistical descriptions by employment status groups—local urban residents and migrants groups, and by survey years—2007 and 2013).

We conducted independent variables as the follows. First, we utilized some variables used in previous studies[5]. These include individual variables likely to affect employment status choice, such as schooling years, tenure years, health status (very good, good, fair, poor) dummy variables, which are the index of human capital, female (female is a binary variable coded 1 if the respondent is a female and 0 otherwise), and Han race (Han race is a binary variable code 1 if the respondent is Han race, and 0 minority). In addition, it is thought the risk aversion preferences vary with these individual attributes, and the risk aversion preference becomes more likely with increasing age.

Some previous studies indicate that family factors, such as child, marriage status, father's education, and father's occupations, can affect the choice to become a self-employed worker, particularly for female workers. We used a marriage dummy, number of children, father's education level (a senior high school and over dummy), and father's occupation (manager dummy) to control the influence of these factors.

As indicated in the liquidity constraint hypothesis, financial factors may affect the choice to become self-employed, and here, we use living with parents and household income as the liquidity constraint index.

It is pointed out that social capital also affects self-employment. It is thought that with higher social capital, there is a greater possibility for settling financial constraint problems and thus a greater chance for success with self-employment. We use two variables—number of relations and frequency of contact relations—as the index of social capital for 2007, using the following questionnaire items: "How many persons do you contact?" and "How frequently do you contact your relations?". In addition, we use "Being trustworthy to friends" and "Being trustworthy to others" as the index of social capital for 2013. Please note that the indices of social capital are different for 2007 and 2013, because the survey items on social capital are different in CHIP2007 and CHIP2013.

We also consider the influences of some special factors in the Chinese labor market. For example, in urban China, the change from rural registration to urban registration is very difficult except under special conditions, such as workers with

higher levels of schooling or with higher skill levels, enlistment in the army, and purchase of a commercial house (investment in housing) in the urban area. It is thought that the method of registration change may influence the choice to become a self-employed worker, so we add a registration change dummy (a binary variable coded 1 if the worker experienced a registration change by the purchase of a commercial house and 0 otherwise) for urban residents group with urban registration in survey year. In addition, because there are regional disparities in China, it is thought that labor demands vary by region, so we add three regional dummies (West, East, and Central regions).

In order to test the hypothesis, wage[6] premiums ($\overline{WP}$) are calculated—the wage differential between own-account worker and employee (Woa/Wee) and that between self-employed employer and employee (Wer/Wee). As the distribution of this variable is skewed, its natural logarithmic forms are used.

We also distinguish employee wages by private and public sector and perform robust checks to test the hypotheses. Reduced earning function estimation results are utilized to calculate these imputed wages and wage differentials (Woa/Weepri, Wer/Weepri).

This paper focuses on self-employed employers, own-account workers, employees, and the unemployed. Considering that the retirement system is structured within the public sector, in order to diminish the effect of that system on analysis results, the analytic objects are limited to groups between the ages of 16 and 60. The samples utilized in the following empirical studies comprise 10,806 urban residents and 6,267 migrants.

4. **Descriptive Statistics Results**

4.1 Distributions of employment status in urban China

The distributions of employment status in urban China are shown in **Table 2**. First, the proportions of self-employed workers are different by local urban residents and migrants groups. For example, in 2013, the divisions are as follows for the local urban

residents group: 1.59% self-employed employers, 4.54% own-account workers, 70.38% employees, and 23.49% the unemployed. In the migrants group, the divisions are as follows: 2.83% self-employed employers, 15.86% own-account workers, 62.77% employees, and 18.54% the unemployed. Compared with the local urban residents group, the proportions of self-employed employers and own-account workers are higher (18.69% for migrants group, 6.13% for local urban residents).

Second, the proportions of self-employed workers (including self-employed employers and own-account workers) increased from 4.14% to 6.13% for local urban residents, while the proportion decreased from 23.63% to 18.69% for the migrants.

Third, there are regional disparities in the proportion of self-employed workers. For example, in 2007, the percentages of self-employed employers and own-account workers and self-employed employers are greater in the Central (5.89% and 26.95%) than that in the East and West regions for migrants, while the percentage of own-account workers is greater in the Central (5.13%) than that in the East and West regions, the percentage of self-employed employers are greater in the East (1.59%) than that in the Central and West regions for local urban residents. The status in 2013 are similar with 2007.

4.2 Wages, work hours and household income by employment status groups

Wages, work hours, and household income by employment status group are shown in **Table 3**.

Considering monthly wage mean values for each group, in 2007, compared with employees, wages are higher for self-employed employers (er/ee1.70) and lower for own-account workers (oa/ee0.84) in local urban residents group, the wages are higher for both self-employed employers (oa/ee1.32) and own-account workers (er/ee1.75) in the migrants group. In 2013, compared with employees, wages are also higher for self-employed employers (er/ee1.47) and lower for own-account workers (oa/ee0.93) in local urban residents group, while in the migrants group, the wages are higher for self-employed employers (oa/ee1.50) , the monthly wage level of own-account workers

group is similar with employees group(er/ee1.00). The wage differentials between employment status groups (er/ee, oa/ee) became smaller in 2013 that that in 2007.

There are work hour disparities among employment status groups. Concretely, in the local urban residents group, compared with employees, the work hours are longer for both own-account workers (oa/ee1.45 for 2007, oa/ee1.31 for 2013) and self-employed employers (er/ee1.28 for 2007, er/ee1.26 for 2013). There are also work hour disparities in the migrants group (oa/ee1.39 and er/ee1.37 for 2007, oa/ee1.29 and er/ee1.25 for 2013).

However, although the yearly household income differentials by employment status group are smaller in both the local urban residents and migrants groups in 2007, the yearly household incomes are higher for self-employed employers group than employees group for both the local urban residents and migrants groups in 2013.

Although these tabulated calculations indicate the existence of wage, work hours, and household income differentials by employment status group and years, it is not clear as to what determines the choice of employment status and which hypothesis explains self-employment. These questions will be answered using the econometric analysis results discussed in the following section.

5. Econometric Analysis Results

5.1 What determines the choice to become a self-employed worker?

Table 4 shows the estimated results of the determinants of employment status by both the local urban residents and migrants groups.

First, the demographic variables affect the choice of self-employment for both local urban resident and migrant groups" would be more appropriate. For example, while there exists an inverse "U" shape relation between age and self-employment (to become a self-employed employer or an own-account worker) for the migrants group in 2007, the same relation exists for both migrants and the local urban residents groups in 2013.

Second, in both the local urban residents and migrants groups, employment status

choices are affected by the level of education. That is, the probability to become a self-employed employer decreases with an increase in the level of education and vice versa in 2007 and 2013.

Third, there exists a change of effects of household income on self-employed employer for the migrants group. For example, the estimated results show that the probability to become a self-employed employer decreases in 2007, while this probability increases in 2013. However, for the local urban residents group, the probability to become a self-employed employer decreases in both 2007 and 2013. This can be explained by the existence of liquidity constraints for self-employed employers. These estimated results reveal that the influence of liquidity constraints increased from 2007 to 2013, and provide evidence that for successful job and business creation, policies (such as financial support policies for small enterprises) to resolve liquidity constraint problems are important in a transition economy (and elsewhere), particularly since after the global financial crisis, liquidity constraint problems have become severe.

Fourth, the Hukou (registration) system influences entry into the self-employment sector. For example, in 2007, the probability to become a self-employed employer increases when a worker changes his registration by purchase of a house as residential property for the local urban residents group, whereas its effect is small for the migrants group. However, in 2013, the probability to become a self-employed employer or an own-account worker decreases when a worker changes his registration by purchase of a house for the local urban residents group, whereas this probability increases for the migrants group. The influence of house purchase on the choice to become a self-employed worker increases from 2007 to 2013 for the migrants group, particularly for the probability of becoming a self-employed employer. These results also indicate there exists a liquidity constraint problem—housing might become a trust condition for a self-employed employer when he receives loan from the formal or informal financial market.

Considering social capital, compared with the workers who contact relations once every week, those who contact relations once every month are more likely to become own-account worker for the local urban residents group in 2007, whereas the influence

of social capital on self-employment is not statistically significant for the migrants group in 2007, and these results are statistically insignificant for both the local urban residents and migrants group in 2013.

Finally, in the migrants group, compared with workers in the West and Central regions, the probability of becoming a self-employed employer and own-account worker is lower for those in the East region in both 2007 and 2013. In addition, in the local urban residents group, the probability of becoming an own-account worker is lower for those in the East region in both 2007.This may be because compared with the West and the Central regions, the level of economic development is higher in the East region, so labor demands for employees results from the modern industrial sector are also relatively higher in that region.

5.2 Hypothesis testing: business start-ups or disguised unemployment?

Next, we turn to the hypothesis testing results. First, the multivariable regression analysis of wages based on Eqs. (2.1)–(2.3) is shown in **Table 5**. The results show the existence of wage differentials between employment status groups. For example, in 2007 and 2013, holding other factors (e.g., human capital) constant, compared with the employees group, wages are higher for the self-employed employer group in both the local urban residents group and the migrants group. In addition, compared with the employees group, wages are lower for the own-account workers group in the local urban residents group in both 2007 and 2013. Although the wage differentials between the employees group and own-account workers group are not statistical significant for migrants group in 2007, wages are lower for own-account workers than employees for migrants group in 2013. Holding other factors constant, a worker can gain more economic benefits by becoming a self-employed employer but gains less by becoming an own-account worker. Compared with the employee, the economic benefit for the self-employed employer is better, but it is worse for the own-account worker. Based on these estimated results, the disguised unemployment and business creation hypotheses are not clearly supported.

Second, in order to directly test these hypotheses using the imputed wages

calculated based upon the results shown in **Table 6**, the reduced multinomial logit analysis is estimated. These estimated results are represented in **Table 7**.

For the local urban residents group, the results show that the wage premium (logWer/Wee -0.3606 and logWoa/Wee 0.4333 in 2007, logWer/Wee -0.1833 and logWoa/Wee -0.0770 in 2013) does not statistically affect the probability of the choices to become a self-employed employer or an own-account worker in both 2007 and 2013. There is no significant positive relation between the wage premium and the probability of being an own-account worker. Based on the individual utility maximum rule (e.g., to gain the highest income), workers possibly chooses to become a self-employed employer or an own-account worker when their associated wage levels are higher than those for employees. Estimated results indicated that the choice to enter the self-employment sector (as either self-employed employers or own-account workers) does not result from perceived economic gains and benefits. These results support the disguised unemployment hypothesis, whereas the business creation hypothesis is rejected in both 2007 and 2013.

For the migrants group, the probability of becoming a self-employed employer is estimated to be negatively affected by the wage premium (logWer/Wee −0.7672) in 2007, and the probability of becoming an own-account worker is estimated to be negatively affected by the wage premium (logWoa/Wee −2.2039) in 2013. It is revealed that although a worker may recognize that there is an economic loss associated with becoming a self-employed employer in 2007 or an own-account worker in 2013, there may be no chance to become an employee, so the worker has no choice but to enter the informal sector and become a self-employed worker in both 2007 and 2013. In that case, the disguised unemployment hypothesis is supported. In addition, the influence of the wage premium (logWoa/Wee) on the probability of becoming an own-account worker is statistical insignificant in 2007, and the influence of the wage premium (logWer/Wee) on the probability of becoming a self-employed employer is statistical insignificant in 2013—the disguised unemployment hypothesis are supported. These results further reflect the possibility of a job-rationing problem in the Chinese urban labor market.

5.3 Robust check of hypothesis testing

We also perform a robust check of the hypotheses tests, and these results are shown in **Table 8.**

First, considering that the labor market in urban China is segmented by the public and private sectors[7], and the wage level in the informal sector is close to that in the private sector, we analyze the estimated results of the effects of wage premiums between the private sector and other sectors (see Estimation 1 in Table 8).

In 2007, the influences of wage premiums (logWer/Weepri) on the probability of becoming a self-employed employer are negatively significant for both the local urban residents and the migrants groups (−0.4643 for the local urban residents group and −0.6948 for the migrants group). In addition, the influence of the wage premium (logWoa/Weepri) on the probability of becoming an own-account worker is insignificant for both the local urban residents and migrants groups. These results are consistent with the above, and the disguised unemployment hypothesis is supported, whereas the business creation hypothesis is rejected in 2007.

However, in 2013, the influences of wage premiums (logWer/Weepri) on the probability of becoming a self-employed employer are positively significant for both the local urban residents and migrants groups (1.4742 for the local urban residents group and 0.0434 for the migrants group). Thus, the business creation hypothesis is supported when a worker opts to become a self-employed employer. Whereas the influences of wage premiums (logWoa/Weepri) on the probability of becoming an own-account worker are negatively significant for both the local urban residents and migrants groups (−3.4175 for the local urban residents group and −3.5337 for the migrants group); thus, the business creation hypothesis is rejected and the disguised unemployment hypothesis is supported again in the case of entry to the informal sector as an own-account worker in 2013.

Along with economic transition and economic development, becoming a self-employed employer seems like a suitable choice for both the local urban residents and migrants groups, since a worker can gain more benefit if he chooses to become a self-employed employer than becoming an employee in the private firms. However,

although a worker may recognize that there is an economic loss associated with becoming an own-account worker, there may be no chance to become an employee. Thus, the worker has no choice but to enter the informal sector and become an own-account worker in both 2007 and 2013. This result suggests that becoming an own-account worker is not a suitable choice from the perspective of monetary gain, and it may be an involuntary choice for a low-level living (subsistence level pointed out by the Dualism theory in development economics).

Second, Estimation 2 shows the results by age groups. In 2013, the influences of wage premiums (logWer/Weep) on the probability of becoming a self-employed employer are positively significant for the group aged more than 50 years old (4.1978), while they are negatively significant for the group aged less than 50 years old ((−2.6700) in the local urban residents group. Therefore, the business creation hypothesis is supported for the older generation group, while it is rejected for the younger generation group in the case of choice to become a self-employed employer in 2013 for local urban residents. When the statistical significance level is set at 10%, the influences of wage premiums on the probability of becoming an own-account worker are positively significant for the group aged more than 50 years old in local urban residents in 2007 (0.7143) and in migrants in 2013 (1.0362). The results reveal that entry to the informal sector (the choice to become a self-employed employer for the local urban residents group, and the choice to become an own-account worker for migrants group) in the initial labor market reform period can provide more benefit. Thus, the business creation hypothesis is supported for the older generation group, whereas this hypothesis is rejected for the younger generation group. The results also indicate that the monetary motivation has been decreasing for the younger generation recently.

Third, we also estimated the results on a regional basis. The results suggest that the business creation hypothesis is rejected and the disguised unemployment hypothesis is supported in the Central, West, and East regions. However, the regional disparity in hypothesis test results is small.

6 Conclusions

This paper provides evidence on the determinants of self-employment for local urban residents and migrants in urban China. Using CHIP2007 and CHIP2013, the employment status is divided into four categories: self-employed employers, own-account workers, employees, and the unemployed. Main findings are as the following.

First, compared with the employee, holding other factors (e.g., human capital) constant, the wage premium associated with the self-employed employer is higher for both the urban registration residents and migrants groups, while the wage premium associated with own-account workers is lower for the local urban residents group.

Second, the influence of the wage premium (logWer/Wee) on the self-employed employer is negatively significant for the local urban residents group in 2007, and they are not statistical significant for the local urban residents group in 2013, and the migrants group in both 2007 and 2013. The results support the disguised unemployment hypothesis, whereas the business creation hypothesis is rejected for the local urban residents and migrants in both 2007 and 2013.

Third, utilizing the wage premiums (logWer/Weepri), the business creation hypothesis is rejected for both the local urban residents group and migrants group in 2007. However, in 2013, the influences of wage premiums on the probability of becoming a self-employed employer are positively significant in both the local urban residents group and the migrants group, so the business creation hypothesis is supported when a worker choice to become a self-employed employer. Whereas the influences of wage premiums on the probability of becoming an own-account worker are negatively significant in both the local urban residents group and the migrants group, so the business creation hypothesis is rejected when a worker choice to become an own-account worker in 2013.

Fourth, for the estimated results by age groups, the results reveal that entry to the informal sector (the choice to become a self-employed employer for the local urban residents group, and the choice to become an own-account worker for migrants group)

in the initial labor market reform period can gain more benefit for the older generation group. Thus, the business creation hypothesis is supported for older generation group, whereas this hypothesis is rejected for the younger generation group.

Fifth, for the estimated results by regional groups, the business creation hypothesis is rejected and the disguised unemployment hypothesis is supported in the Central, West, and East regions. However, the regional disparity in the hypothesis test results is small.

These estimated results revealed that excepted the case which a worker choose to become a self-employed employer in 2013 and the case which older generation group choose to become an employer in 2013, compared with employees, a worker in self-employment sector does not gain more, and there seemingly is no better choice in urban China. Some policy implications based on these empirical study results should be pointed out here.

One implication is that a self-employed employer has to face business risks and financial constraints. If the self-employed employer (e.g., the owner of a small private firm) cannot settle the liquidity constraint problem through the formal financial market (e.g., by getting a loan from a government bank), business continuity will become difficult. Liquidity constraint problems already exist (Haggard and Huang 2008). It is known that the public banks do not like to lend to small private firms, so most small firms gain financial support through informal financial markets (e.g.. inter-household risk sharing and illegal loans).The estimated results in this paper (see Table4) showed that the effect of household income on the self-employed employer group is greater than that for the other groups. In order to promote more new business for greater economic growth in the future, the Chinese government should establish and implement financial support policies for small firms.

A second implication is the relation with labor market segmentation by the formal and informal sectors. It is thought that this segmentation results from human capital endowment differentials and some system discriminations. For example, there is employment discrimination in the public sector by the urban and the rural registrations, so most migrants cannot be recruited as regular workers in the public sector. In addition,

it is known that in urban China, social security systems differ between the formal and informal sectors. For example, in the public sector, firms charge a portion of the social security fee to their employees, whereas most workers in the self-employed sector have to pay the social security fee themselves, and the compensation (firm welfare) is more for employees who worked in the public sector or for large firms than that for those who worked in other sectors. To diminish the segmentation of the informal sector and the formal sector in urban China, the integration of the social security system is an important issue for the Chinese government.

Finally, although we conducted an empirical study to reveal the determinants of self-employment and used the hypothesis tests discussed in this paper, there are two points worthy of attention. First, because we utilized one period of cross-sectional data, there might be heterogeneity and endogeneity problems, and a study using panel data should be conducted in the future. Second, this paper is a static analysis for self-employment. It is thought that empirical studies on dynamic changes in self-employment (the transition into and exit from self-employment) are also important issues (Le, 1999)[8], and dynamic analysis using longitudinal analysis methods is our research issue in another paper.

Notes

1. For detailed surveys of empirical studies on self-employment, please see Yamada (1996), and Le (1999).
2. There is no unified definition of self-employed workers in previous studies in China. Based on the survey data used in the paper and firm classification rules, referring Earle and Sakova (2000), Hanley (2000), we defined own-account workers are those who work in small firms (or unit) which only him (herself) or no-paid family workers work in, self-employed employees are those who work in small firms with workers less than 8 and they are the owners of these small firms in this paper. For the data from NBS in Chinese Statistical Yearbook, only own-account workers are published.
3. The phenomenon of communist party members and cadres leaving the public sector to become business owners in the private sector in the 1980s is called "Xia Hai" in Chinese.

4. Number of children household income, family background (father's education, father's occupation), and social capital (the number of relations and the frequency of contact with relations in CHIP2007, and being trustworthy to friends and being trustworthy to others in CHIP2013) are used as identification variables in this study.
5. For example, Blau(1985), Borjas (1986), Evans and Leighton (1989), Amit et al. (1990), Bruce(1999), Hamilton(2000), Dunn and Holtz-Eakin, (2000), Zhang and Pan (2012) pointed out individual attributes (such as gender, human capital, and family background) should affect the choice to become a self-employed worker. In addition, Evans and Jovanovic (1989), Lentz and Laband （1990), Holtz-Eakin et al. (1994), Dunn and Holtz-Eakin (2000) indicated that financial constraints also affect the entry to the self-employed sector.
6. Wage survey items in CHIP2007 for urban registration residents comprises the basic wage, bonus, cash subsidy, and no cash subsidy, whereas the wage survey for migrants comprises the basic wage, so the logarithm of the monthly wage based on the basic wage is utilized in the paper.
7. For empirical studies on labor market segmentation by public and private sector in urban China, please see Dong and Bowels (2002), Yin and Gan (2009), Lu, et al.(2012) , Chen, et al. (2005), Zhang and Xue (2008), Ye, et al. (2011), Demurger, et al. (2012), and Ma (2009, 2014,2015,2016).
8. For longitudinal analysis using panel data, please see Blau (1987), Evans and Jovanonic (1989), Blanchflower and Meyer (1992), Xie(2012) for the transition into the self-employment, and Evans and Leighton(1989) , Bates(1990) for the exit from the self-employment.

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Table1 Statistical descriptions

Panel A: 2007

	Urban registration residents						Migrants					
	Employee		Employer		Own-account		Employee		Employer		Own-account	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
Age	38	11	35	11	38	12	30	9	34	8	36	9
Schooling years	12	3	11	3	11	3	9	2	9	2	8	2
Health status												
Very good	0.1839	0.3875	0.2321	0.4241	0.1770	0.3826	0.4471	0.4973	0.3942	0.4905	0.4058	0.4915
Good	0.5666	0.4956	0.6250	0.4863	0.5694	0.4964	0.4054	0.4911	0.4891	0.5017	0.3967	0.4897
Fair	0.2308	0.4214	0.1250	0.3322	0.2344	0.4247	0.1357	0.3426	0.1022	0.3040	0.1757	0.3809
Poor	0.0187	0.1354	0.0179	0.1330	0.0191	0.1373	0.0118	0.1078	0.0146	0.1204	0.0217	0.1460
Female	0.5363	0.4987	0.5357	0.5010	0.5502	0.4987	0.6481	0.4777	0.6131	0.4888	0.6341	0.4821
Ethnicity(Han)	0.9905	0.0972	0.9911	0.0945	0.9809	0.1373	0.9794	0.1420	0.9854	0.1204	0.9873	0.1120
Married	0.7654	0.4238	0.7411	0.4400	0.7656	0.4247	0.0082	0.0903	0.0073	0.0854	0.0109	0.1038
Household income	10.8947	0.6416	11.1407	0.5505	10.7339	0.7303	9.9350	0.5995	9.8722	0.6060	9.9548	0.6060
Father: senior high school and over	0.2152	0.4110	0.1518	0.3604	0.1627	0.3700	0.1257	0.3316	0.0657	0.2487	0.0942	0.2924
Father: manager	0.0698	0.2548	0.0714	0.2587	0.0383	0.1923	0.0405	0.1973	0.0438	0.2054	0.0489	0.2159
Hukou change by house purchase	0.0597	0.2369	0.1696	0.3770	0.1292	0.3362	0.0006	0.0242	0.0001	0.0242	0.0018	0.0426
Numer of relations	38	44	36	32	32	29	34	54	36	59	33	130
The frequency of contact relations												
Once every week	0.5994	0.4901	0.5446	0.5002	0.4737	0.5005	0.5905	0.4919	0.6058	0.4905	0.5580	0.4971
Once every month	0.3368	0.4726	0.3839	0.4885	0.4689	0.5002	0.3420	0.4745	0.3212	0.4686	0.3533	0.4784
Once every year	0.0638	0.2445	0.0714	0.2587	0.0574	0.2332	0.0676	0.2511	0.0730	0.2611	0.0888	0.2847
Regions												
East	0.5361	0.4987	0.5714	0.4971	0.3684	0.4835	0.6052	0.4890	0.3577	0.4811	0.2500	0.4334
West	0.1727	0.3780	0.1607	0.3689	0.1914	0.3943	0.1539	0.3610	0.0730	0.2611	0.1359	0.3430
Central	0.2912	0.4544	0.2679	0.4448	0.4402	0.4976	0.2409	0.4278	0.5693	0.4970	0.6141	0.4872
Number of observations	5247		112		209		1702		137		552	

Source : Calculated using CHIP2007.

Panel B: 2013

	Urban registration residents						Migrants					
	Employee		Employer		Own-account		Employee		Employer		Own-account	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
Age	40	10	42	8	42	9	36	10	40	7	40	8
Schooling years	12	3	11	3	10	3	10	3	9	2	9	3
Health status												
Very good	0.3414	0.4742	0.4320	0.4968	0.3271	0.4696	0.4058	0.4914	0.4865	0.5067	0.3298	0.4714
Good	0.4796	0.4996	0.4556	0.4995	0.4979	0.5005	0.4555	0.4983	0.4324	0.5022	0.5106	0.5012
Fair	0.1623	0.3687	0.0947	0.2936	0.1458	0.3533	0.1230	0.3287	0.0811	0.2767	0.1436	0.3516
Poor	0.0168	0.1284	0.0178	0.1324	0.0292	0.1684	0.0157	0.1244	0.0000	0.0000	0.0160	0.1256
Female	0.4416	0.4966	0.3195	0.4677	0.4521	0.4982	0.5851	0.4930	0.7568	0.4350	0.6117	0.4887
Ethnicity(Han)	0.9565	0.2041	0.9349	0.2474	0.9229	0.2670	0.9594	0.1974	1.0000	0.0000	0.9415	0.2353
Married	0.8594	0.3476	0.9290	0.2576	0.9375	0.2423	0.7945	0.4043	0.9730	0.1644	0.9521	0.2141
Household income	10.8905	0.5857	11.2255	0.6691	10.7797	0.6913	10.6426	0.5610	11.0551	0.4710	10.8837	0.5882
Father: senior high school and over	0.1739	0.3790	0.1302	0.3375	0.0917	0.2889	0.0890	0.2849	0.1081	0.3148	0.0479	0.2141
Father: manager	0.0659	0.2481	0.0473	0.2130	0.0479	0.2138	0.0131	0.1137	0.0270	0.1644	0.0053	0.0729
Hukou change by house purchase	0.1015	0.3019	0.0769	0.2673	0.1167	0.3214	0.0026	0.0511	0.0541	0.2292	0.0106	0.1029
Being trustworthy to friends	0.6850	0.4645	0.6982	0.4604	0.6979	0.4596	0.6479	0.4779	0.7297	0.4502	0.6489	0.4786
Being trustworthy to others	0.6850	0.4645	0.6982	0.4604	0.6979	0.4596	0.6479	0.4779	0.7297	0.4502	0.6489	0.4786
Regions												
East	0.4300	0.4951	0.4379	0.4976	0.4042	0.4912	0.4948	0.5003	0.2973	0.4634	0.3723	0.4847
West	0.2201	0.4143	0.2012	0.4021	0.1875	0.3907	0.1702	0.3760	0.1892	0.3971	0.0957	0.2950
Central	0.3499	0.4770	0.3609	0.4817	0.4083	0.4920	0.3351	0.4723	0.5135	0.5067	0.5319	0.5003
Number of observations	7511		169		480		764		37		188	

Source : Calculated using CHIP2013.

Table2 Distributions of employment status in urban China

	Total	East	Central	West
		Panel A: 2007		
Urban registration residents				
Self-employed Employer	1.43	1.59	1.38	1.11
Own-account woker	2.71	1.99	3.64	3.01
Employee	65.84	68.7	63.67	62.43
The unemployed	30.02	27.72	31.31	33.45
Total	100	100	100	100
Number of observations	10,806	5,224	3,325	2,257
Migrants				
Self-employed Employer	4.63	4.18	5.84	3.75
Own-account woker	19.00	13.96	26.95	20.14
Employee	63.99	74.56	46.21	63.77
The unemployed	12.38	7.30	21.00	12.34
Total	100	100	100	100
Number of observations	6,267	3,302	1,952	1,013
		Panel B: 2013		
Urban registration residents				
Self-employed Employer	1.59	1.63	1.56	1.57
Own-account woker	4.54	4.53	5.13	3.65
Employee	70.38	72.22	69.44	68.51
The unemployed	23.49	21.62	23.86	26.27
Total	100	100	100	100
Number of observations	11,730	4,903	4,090	2,373
Migrants				
Self-employed Employer	2.83	1.90	3.48	3.69
Own-account woker	15.86	12.76	21.61	9.68
Employee	62.77	69.66	53.48	67.74
The unemployed	18.54	15.69	21.43	18.89
Total	100	100	100	100
Number of observations	1,343	580	546	217

Source: Calculated using CHIP2007 and CHIP2013.

Note: Calculated for groups aged16～60.

Table3 Wages, work hours and household income by employment status group

		Employee	Employer	Own-account	er/ee	oa/ee
			Panel A: 2007			
Urban registration residents						
Earning monthly(Yuan)	Mean	2238	3802	1882	1.70	0.84
	S.D.	1831	3802	2022	2.08	1.10
Workhours weekly	Mean	42	55	61	1.31	1.45
	S.D.	10	18	22	1.80	2.20
Household income	Mean	64966	76892	59158	1.18	0.91
Yearly(Yuan)	S.D.	52247	46686	67007	0.89	1.28
Migrants						
Earning monthly(Yuan)	Mean	1480	2583	1952	1.75	1.32
	S.D.	803	1893	1542	1.90	1.92
Workhours weekly	Mean	57	78	79	1.37	1.39
	S.D.	14	18	19	1.29	1.36
Household income	Mean	25959	25407	26452	0.98	1.02
Yearly(Yuan)	S.D.	21893	24614	22360	1.12	1.02
			Panel B: 2013			
Urban registration residents						
Earning monthly(Yuan)	Mean	15	22	14	1.47	0.93
	S.D.	14	23	22	1.64	1.57
Workhours weekly	Mean	47	59	60	1.26	1.28
	S.D.	12	18	21	1.50	1.75
Household income	Mean	64755	94941	64239	1.47	0.99
Yearly(Yuan)	S.D.	43607	80881	78623	1.85	1.80
Migrants						
Earning monthly(Yuan)	Mean	12	18	12	1.50	1.00
	S.D.	9	11	10	1.22	1.11
Workhours weekly	Mean	52	65	67	1.25	1.29
	S.D.	14	18	19	1.29	1.36
Household income	Mean	49478	72290	63233	1.46	1.28
Yearly(Yuan)	S.D.	33882	35313	37380	1.04	1.10

Source : Calculated using CHIP2007 and CHIP2013.

Table4 Determinants of employment status

Panel A: 2007

	Urban registration residents						Migrants					
	Employer		Own-Account		Unemployed		Employer		Own-Account		Unemployed	
	coeff.	z-value	coeff.	z-value	coeff.	z-value	coeff.	z-value	coeff.	z-value	coeff.	z-value
Age	0.0265	0.35	-0.0469	-0.90	-0.2395 ***	-11.08	0.3306 ***	4.58	0.3122 ***	8.14	-0.0318	-0.76
Age squared/100	-0.0881	-0.92	0.0382	0.59	0.4003 ***	15.44	-0.4110 ***	-3.99	-0.3631 ***	-6.83	0.0698	1.18
Schooling years	-0.1496 ***	-4.65	-0.1075 ***	-4.58	-0.0228 **	-2.51	-0.0104	-0.26	-0.1577 ***	-6.57	-0.1857 ***	-6.03
Health status (Poor)												
Very good	-0.2164	-0.29	-0.0438	-0.08	-1.1097 ***	-6.44	0.1723	0.22	0.1338	0.32	-0.8155 *	-1.93
Good	-0.1989	-0.27	0.0749	0.14	-1.0552 ***	-6.79	0.3093	0.40	-0.1102	-0.27	-0.6482	-1.55
Fair	-0.8052	-1.05	0.1397	0.26	-0.7854 ***	-4.97	-0.2501	-0.31	0.0109	0.03	-1.1317 ***	-2.53
Female	0.0954	0.48	0.0901	0.62	-1.4926 ***	-21.97	-0.1958	-1.04	-0.0510	-0.45	-1.8992 ***	-12.24
Ethnicity(Han)	-0.2601	-0.25	-0.8080	-1.51	-0.1477	-0.46	0.2453	0.33	0.4199	0.92	-0.1546	-0.31
Married	0.5539	1.43	0.4617 *	1.63	-0.0076	-0.07	-0.3636	-0.34	-0.2126	-0.39	-0.0901	-0.14
Household income	0.8297 ***	5.24	-0.0702	-0.56	-0.5672 ***	-10.36	-0.3491 **	-2.22	-0.1629 *	-1.79	-0.1211	-1.10
Father: senior high school and over	-0.3758	-1.37	-0.1696	-0.86	-0.2221 ***	-2.59	-0.7017 *	-1.95	-0.3271 *	-1.81	-0.1217	-0.58
Father: manager	0.1794	0.47	-0.6076 *	-1.64	-0.1116	-0.86	-0.0185	-0.04	0.0416	0.16	0.0349	0.11
Hukou change by house purchase	0.7962 ***	2.91	0.7764 ***	3.47	0.4577 ***	3.67	-11.5178	-0.01	0.5376	0.35	-10.4605	-0.01
Numer of relations	-0.0025	-1.03	-0.0022	-1.06	-0.0042 ***	-4.14	0.0004	0.44	0.0000	0.06	-0.0023	-1.19
The frequency of contact relations(Once every week)												
Once every month	0.2486	1.22	0.5705 ***	3.88	0.1091 *	1.68	-0.0532	-0.27	0.1524	1.30	-0.1869	-1.23
Once every year	0.2911	0.75	0.1711	0.55	-0.0834	-0.63	-0.1264	-0.35	0.1344	0.66	-0.2699	-0.97
Region(West+Central regions)												
East region	-0.2103	-1.00	-0.6498 ***	-4.07	-0.1693 **	-2.55	-0.8698 ***	-4.18	-1.2964 ***	-9.97	-1.1018 ***	-6.59
Constant	-11.8432 ***	-4.86	0.2498	0.14	9.5793 ***	11.89	-4.6793 **	-2.08	-3.9343 ***	-3.06	3.8134 ***	2.61
Number of observations			7744						2691			
Log likelihood			-4718.81						-2295.24			
Pseudo R2			0.2180						0.1562			
Chi-squared			2630.71						850.01			

Source: Calculated using CHIP2007.

Note: 1. *,**,*** :statistical significant in 10%,5%,1% level.

2. Reference category=employee group.

Panel B: 2013

	Urban registration residents						Migrants					
	Employer		Own-Account		Unemployed		Employer		Own-Account		Unemployed	
	coeff.	z-value	coeff.	z-value	coeff.	z-value	coeff.	z-value	coeff.	z-value	coeff.	z-value
Age	0.2366 ***	2.83	0.1059 **	2.20	-0.5231 ***	-23.15	0.5439 **	2.48	0.2163 **	2.49	-0.3331 ***	-4.74
Age squared/100	-0.2874 ***	-2.88	-0.1434 **	-2.50	0.6968 ***	26.05	-0.6517 **	-2.40	-0.2379 **	-2.22	0.4491 ***	5.13
Schooling years	-0.1753 ***	-6.25	-0.2339 ***	-13.15	-0.1304 ***	-12.46	-0.0488	-0.67	-0.0770 **	-2.26	-0.1409 ***	-4.16
Health status (Poor)												
Very good	0.0884	0.15	-0.1292	-0.43	-1.3122 ***	-8.80	12.9539	0.02	0.1812	0.26	-1.3572 ***	-2.87
Good	-0.1837	-0.30	-0.1117	-0.37	-1.2189 ***	-8.47	12.5027	0.02	0.2570	0.37	-1.5299 ***	-3.27
Fair	-0.6853	-1.07	-0.3934	-1.25	-0.9834 ***	-6.61	11.9642	0.02	0.2752	0.39	-1.2744 ***	-2.57
Female	0.6361 ***	3.73	0.0528	0.54	-1.6681 ***	-26.25	1.0120 **	2.39	0.2301	1.29	-2.1186 ***	-9.90
Ethnicity(Han)	-0.6095 *	-1.85	-0.5942 ***	-3.18	-0.2375 *	-1.88	11.9254	0.03	-0.4864	-1.24	0.0280	0.07
Married	0.1921	0.55	0.6522 ***	2.99	-0.0521	-0.52	0.9296	0.83	0.7556 *	1.82	0.6126 *	1.90
Household income	1.2891 ***	9.03	0.0353	0.40	-0.4932 ***	-9.80	1.4550 ***	4.51	0.8892 ***	5.45	-0.4506 ***	-2.84
Father: senior high school and over	-0.3040	-1.25	-0.4144 **	-2.46	-0.1023	-1.10	0.4129	0.67	-0.4798	-1.22	-0.4677	-1.16
Father: manager	-0.3451	-0.92	-0.1072	-0.47	-0.0405	-0.34	-0.2992	-0.25	-1.3329	-1.22	0.6494	0.95
Hukou change by house purchase	-0.6451 **	-2.14	-0.3368 **	-2.20	-0.0850	-0.96	4.5330 ***	3.68	1.9612 *	1.77	0.1456	0.11
Being trustworthy to friends	-0.0133	-0.07	0.2135 *	1.94	-0.0625	-1.00	0.1727	0.41	0.0019	0.01	0.4115 **	2.05
Being trustworthy to others	0.1648	0.90	-0.1754	-1.48	-0.0626	-0.89	0.5712	1.37	-0.1948	-0.83	-0.0124	-0.06
Region(West+Central regions)												
East region	-0.2612	-1.55	0.0314	0.31	-0.0818	-1.36	-1.1565 ***	-2.84	-0.5517 ***	-3.06	-0.3902 **	-2.17
Constant	-20.2958 ***	-8.51	-2.2946 *	-1.69	16.4737 ***	23.05	-55.1486	-0.08	-15.1148 ***	-5.96	11.9710 ***	5.57
Number of observations			10582						1204			
Log likelihood			-6513.08						-996.234			
Pseudo R2			0.2159						0.1704			
LR chi2			3585.87						409.28			

Source: Calculated using CHIP2013.

Note: 1. *,**,*** :statistical significant in 10%,5%,1% level.

2. Reference category=employee group.

Table 5 Results of wage function

	2007				2013			
	Urban		Migrants		Urban		Migrants	
	coeff.	t-value	coeff.	t-value	coeff.	t-value	coeff.	t-value
Employment status(Employee)								
Self-employed employer	0.3034 ***	5.49	0.2746 ***	5.93	0.1199 **	2.28	0.1997 *	1.85
Own-account worker	-0.2695 ***	-5.99	0.0026	0.10	-0.1127 ***	-3.60	-0.1192 **	-2.17
Age	-0.0983 ***	-13.42	0.0258 ***	2.72	-0.0628 ***	-6.05	0.0075	0.25
Age squared/100	0.1619 ***	15.53	-0.0442 ***	-3.58	0.0888 ***	6.67	-0.0180	-0.46
Tenure years	0.0295 ***	10.04	0.0405 ***	7.76	0.0172 ***	6.03	0.0190 **	2.18
Tenure years squared/100	-0.0485 ***	-5.69	-0.1394 ***	-5.41	-0.0221 ***	-2.67	-0.0241	-0.79
Schooling years	0.0188 ***	5.43	0.0529 ***	7.37	0.0745 ***	13.15	0.0629 ***	3.47
Learning achievement	0.0551 ***	2.99	0.0162	0.71	0.0899 ***	4.81	0.0740	0.90
Health status (Poor)								
Very good	-0.4178 ***	-5.91	0.0506	0.60	-0.1048 *	-1.75	0.0881	0.49
Good	-0.3230 ***	-4.70	0.0699	0.85	-0.0855	-1.45	0.1586	0.91
Fair	-0.2012 ***	-2.94	-0.0153	-0.17	-0.0179	-0.30	0.3120 *	1.74
Female	-0.5782 ***	-19.03	-0.1301 ***	-3.08	0.0356	1.61	0.1628 **	2.31
Ethnicity(Han)	-0.0965	-1.12	0.0223	0.31	0.1331 ***	3.57	0.3380 ***	3.07
Married	0.0556 *	1.73	0.0056	0.06	-0.0048	-0.18	-0.1254 *	-1.75
Industrials(No-Manufacture)								
Manufacture	-0.1386 ***	-7.55	-0.0460 *	-1.75	0.0103	0.50	0.0396	0.74
Region(West+Central regions)								
East region	0.2278 ***	10.60	0.4652 ***	9.24	0.1645 ***	10.86	0.1508 ***	3.50
lambda(employees)	9.4229 ***	14.99	-1.6685 ***	-2.82	-1.9653 ***	-8.55	-0.0187	-0.03
lambda(employers)	-18.1061 ***	-22.76	2.0140 **	2.25	-17.1662 ***	-24.82	-15.9453 ***	-11.20
lambda(own-account)	-2.3523 **	-2.26	-1.1918 ***	-2.65	-1.4690 **	-2.12	-1.0987	-0.71
Constant	12.4516 ***	13.56	0.6744	0.94	17.6539 ***	23.26	14.3214 ***	7.73
Number of observations	5389		2918		8359		996	
adj R-squared	0.3232		0.2162		0.2861		0.2273	

Source: Calculated using CHIP2007 and CHIP2013.

Note: *,**,*** :statistical significant in 10%,5%,1% level.

Table6 Wage function by employment status groups

Panel A: 2007

	Urban registration residents						Migrants					
	Employee		Employer		Own-account		Employee		Employer		Own-account	
	coeff.	t-value	coeff.	t-value	coeff.	t-value	coeff.	z-value	coeff.	z-value	coeff.	z-value
Age	-0.0603 ***	-8.10	0.0461	0.57	0.0959 *	1.96	0.0395 ***	4.25	-0.0531	-0.71	-0.0546	-1.52
Age squared/100	0.0921 ***	8.99	-0.0965	-0.87	-0.1787 ***	-2.90	-0.0611 ***	-4.94	0.0561	0.58	0.0643	1.43
Tenure years	0.0353 ***	11.48	-0.0875 **	-2.52	0.0180	0.65	0.0473 ***	7.85	0.0948 **	2.07	0.0214	1.58
Tenure years squared/100	-0.0651 ***	-7.33	0.3086 **	2.49	-0.0020	-0.02	-0.1328 ***	-4.40	-0.6366 **	-2.51	-0.0755	-1.24
Schooling years	0.0188 ***	6.02	0.0619 *	1.64	0.0378	1.51	0.0455 ***	6.95	0.0217	0.31	0.0514 **	2.76
Learning achievement	0.0974 ***	5.04	0.2537	1.55	-0.2908 **	-2.06	0.0270	1.07	0.0455	0.27	-0.1452 **	-2.09
Health status (Poor)												
Very good	-0.2505 ***	-3.42	-1.0563 *	-1.85	-0.4448	-0.82	0.0508	0.50	0.4193	0.70	0.0138	0.07
Good	-0.1997 ***	-2.81	-0.2319	-0.41	-0.3076	-0.59	0.0584	0.57	0.2013	0.33	0.0260	0.13
Fair	-0.1715 **	-2.42	-0.6567	-1.13	-0.8355	-1.58	0.0407	0.39	0.2939	0.47	-0.1313	-0.64
Female	-0.2622 ***	-10.02	0.0020	0.01	0.1475	1.07	-0.1299 ***	-4.37	-0.1502	-0.58	-0.1199 *	-1.73
Ethnicity(Han)	-0.0376	-0.42	-0.7504	-0.91	-0.4477	-0.91	0.0197	0.26	0.4593	0.81	0.3052	1.24
Married	0.1027 ***	3.18	0.8314 *	2.51	0.6953 ***	2.59	-0.0299	-0.25	0.1137	0.13	0.3429	1.28
Training	0.0545 ***	2.96	-0.3336 *	-1.89	-0.2626 *	-1.88	0.0875 ***	2.58	-0.3522	-1.54	-0.1275 *	-1.71
Industrials(No-Manufacture)												
Manufacture	-0.1708 ***	-8.85	-0.2173	-1.35	-0.1479	-1.09	-0.0565 **	-2.23	0.5142	1.19	-0.0796	-0.44
Region(West+Central regions)												
East region	0.3531 ***	18.10	0.6384 ***	3.05	0.1600	1.10	0.3207 ***	6.73	0.3010	0.64	0.5850 ***	4.33
lambda(employees)	-3.7639 ***	-15.15	-	-	-	-	-0.0169	-0.05	-	-	-	-
lambda(employers)	-	-	-0.4268	-0.14	-	-	-	-	0.1312	0.03	-	-
lambda(own-account)	-	-	-	-	6.1358	1.14	-	-	-	-	-1.4954	-1.44
Constant	4.3043 ***	17.19	2.6810	0.86	-3.7273	-0.93	0.2102	0.94	1.9633	0.54	2.7318 **	2.17
Number of observations	5054		110		203		1687		135		547	
adj R-squared	0.2540		0.3323		0.2292		0.2446		0.0463		0.1072	

Source: Calculated using CHIP2007.

Note: *,**,*** :statistical significant in 10%,5%,1% level.

Panel B: 2013

	Urban registration residents						Migrants					
	Employee		Employer		Own-account		Employee		Employer		Own-account	
	coeff.	t-value	coeff.	t-value	coeff.	t-value	coeff.	z-value	coeff.	z-value	coeff.	z-value
Age	-0.0151	-1.44	0.0187	0.30	-0.0486	-0.94	0.1057 ***	3.33	-0.4566 **	-2.32	0.1168 *	1.69
Age squared/100	0.0278 **	2.08	-0.0186	-0.25	0.0641	1.00	-0.1530 ***	-3.62	0.5430 **	2.23	-0.1185	-1.36
Tenure years	0.0223 ***	7.29	0.0610 **	2.11	0.0315 **	1.99	0.0217 **	2.16	0.0619	1.12	0.0657 **	2.56
Tenure years squared/100	-0.0289 ***	-3.23	-0.2069 **	-2.11	-0.0953 *	-1.92	-0.0114	-0.31	-0.2039	-0.98	-0.2447 ***	-2.99
Schooling years	0.0533 ***	13.24	0.0965 ***	3.55	0.1521 ***	4.71	0.0393 ***	2.85	0.0938	1.55	0.1314 ***	2.84
Learning achievement	0.0859 ***	4.44	-0.0957	-0.55	0.0355	0.27	0.1518 *	1.68	-0.0651	-0.18	0.0113	0.04
Health status (Poor)												
Very good	0.0457	0.70	0.6674	1.43	0.2226	0.89	0.2484	1.21	-0.7666	-1.66	0.3997	0.97
Good	-0.0019	-0.03	0.5982	1.29	0.2515	1.03	0.2633	1.30	-0.5270	-1.12	0.3896	0.97
Fair	-0.0418	-0.64	0.7004	1.42	0.3400	1.31	0.3314	1.59	-0.6380	-0.09	0.2250	0.53
Female	-0.1005 ***	-4.48	-0.1331	-0.92	-0.2920 ***	-3.13	-0.4283 ***	-5.41	-0.4457	-1.49	-0.1470	-1.22
Ethnicity(Han)	0.0265	0.70	0.7034 ***	2.65	0.5295 ***	2.85	0.1291	1.04	-0.0010	-0.22	0.7241 ***	2.93
Married	0.0340	1.27	-0.0896	-0.36	0.0713	0.39	-0.0383	-0.53	-0.1036	-0.15	-0.7513 **	-2.56
Industrials(No-Manufacture)												
Manufacture	-0.0206	-0.98	0.2452	1.27	0.2329	0.64	0.0257	0.45	0.2221	0.58	0.5201 *	1.95
Region(West+Central regions)												
East region	0.1974 ***	12.46	0.1745	1.37	0.0512	0.59	0.0982 **	1.98	0.2185	0.84	0.0113	0.10
lambda(employees)	-1.9440 ***	-7.81	-		-		1.2771	1.58	-	-	-	-
lambda(employers)	-	-	-10.4100 ***	-4.25	-		-	-	-9.7219	-1.61	-	-
lambda(own-account)	-	-	-		-9.6983 ***	-2.83	-	-	-	-	-7.1247 **	-1.76
Constant	2.2409 ***	6.82	7.7020 ***	3.27	7.9473 ***	2.78	-0.7020	-0.70	19.0175 ***	2.92	3.0081	0.87
Number of observations	7399		164		478		749		37		183	
adj R-squared	0.2422		0.2633		0.1284		0.1281		0.1047		0.1967	

Source: Calculated using CHIP2013.

Note: *,**,*** :statistical significant in 10%,5%,1% level.

Table7 Results of hypothesis testing

	Employer		Own-account	
	coeff.	z-value	coeff.	z-value
		Panel A: 2007		
Urban registration residents				
log(Woa/Wee)	0.0625	0.16	0.4344	1.50
log(Wer/Wee)	-0.3606	-1.36	-0.0836	-0.45
Migrants				
log(Woa/Wee)	-0.7700	-0.99	0.0445	0.09
log(Wer/Wee)	-0.7672 **	-3.26	-0.7562 ***	-4.46
		Panel B: 2013		
Urban registration residents				
log(Woa/Wee)	-2.6443 ***	-5.70	-0.0770	-0.20
log(Wer/Wee)	-0.1833	-0.44	3.8278 ***	9.37
Migrants				
log(Woa/Wee)	-1.3511	-1.27	-2.2039 ***	-3.81
log(Wer/Wee)	-0.0476	-0.03	1.8427 **	2.21

Source: Calculated using CHIP2007 and CHIP2013.

Note: 1.*,**,*** :statistical significant in 10%,5%,1% level.

2. The specification of Strauctural MNL is similar to that shown in Table4, but dependent variable has only three categories(omitting unemployment group) and the predicted earning differentials log(Woa/Wee) and log(Wer/Wee) are added to the regressors.All other independent variables shown in Table4 are also inculused here,but not shown.

Table8 Robust check of hypothesis testing

	2007				2013			
	Employer		Own-account		Employer		Own-account	
	coeff.	z-value	coeff.	z-value	coeff.	z-value	coeff.	z-value
【Estimation1: sector groups】								
Urban registration residents								
log(Eoa/Eeepri)	-0.5881 *	-1.71	-0.2580	-1.02	-0.6978	-1.31	-3.4175 ***	-8.89
log(Eer/Eeepri)	-0.4643 **	-2.14	0.0256	0.17	1.4642 ***	3.70	2.3267 ***	7.98
log(Eoa/Eeepub)	-0.2763	-0.68	0.3085	1.03	-0.4533 ***	-0.97	-2.7620 ***	-8.55
log(Eer/Eeepub)	-0.4242 *	-1.96	0.1013	0.67	1.7171	4.23	2.4940 ***	8.29
Migrants								
log(Eoa/Eeepri)	-0.8473	-1.05	-0.0558	-0.11	-2.2899 ***	-1.57	-3.5337 ***	-4.85
log(Eer/Eeepri)	-0.6948 ***	-2.94	-0.7367 ***	-4.34	0.0434 ***	0.04	1.6876 ***	2.56
log(Eoa/Eeepub)	1.1734 *	1.76	1.8094 ***	4.42	1.3117	0.171	-3.3883 ***	-5.01
log(Eer/Eeepub)	-0.6681 ***	-2.76	-0.6303 ***	-3.70	-0.2177	-0.18	1.3779 **	2.10
【Estimation2: Age groups】								
Urban registration residents								
log(Woa/Wee)	0.0043	0.01	0.3111	1.07	-1.8993 ***	-3.95	0.0091	0.02
log(Wer/Wee)	-0.3898	-1.38	0.1610	0.80	-2.6700 ***	-4.70	3.9800 ***	9.28
log(Woa/Wee)*aged50 and over	0.9859	1.59	0.7143 *	1.88	-1.4882 ***	-2.62	-0.1753	-0.33
log(Wer/Wee)*aged50 and over	0.2867	0.46	-1.2099 ***	-2.83	4.1978 ***	5.90	-0.5951	-1.25
Migrants								
log(Woa/Wee)	-0.7328	-0.94	0.0467	0.10	-1.2859	-1.12	-2.5899 ***	-4.17
log(Wer/Wee)	-0.6855 ***	-2.83	-0.6710 ***	-3.83	-0.1104	-0.07	1.5062 *	1.78
log(Woa/Wee)*aged50 and over	-3.0720	-0.85	-1.2476	-0.78	-0.8458	-0.55	1.0362 *	1.90
log(Wer/Wee)*aged50 and over	-1.0478	-1.00	-0.9557	-1.35	1.2984	1.17	0.0807	0.18
【Estimation3:Regional groups】								
Urban registration residents								
East region								
log(Woa/Wee)	-0.2658	-0.51	0.4150	0.84	-1.4600 **	-2.50	-1.1585 **	-2.15
log(Wer/Wee)	-0.8592 **	-2.26	0.1126	0.38	-0.4374	-0.73	3.1473 ***	5.33
Central/West region								
log(Woa/Wee)	0.5484	0.91	0.4239	1.15	-4.0376 ***	-6.17	0.7906	1.49
log(Wer/Wee)	0.1454	0.38	-0.1806	-0.76	0.0431	0.07	4.7001 ***	8.29
Migrants								
East region								
log(Woa/Wee)	-1.7440	-1.27	0.0226	0.02	-1.7323	-0.74	-3.4424 ***	-3.23
log(Wer/Wee)	-1.7295 ***	-3.92	-2.3017 ***	-6.83	1.4271	0.35	2.9790 *	1.77
Central/West region								
log(Woa/Wee)	-0.8983	-0.90	-0.5651	-0.97	-1.1744	-0.91	-1.8325 **	-2.53
log(Wer/Wee)	-0.1844	-0.60	0.0555	0.29	-0.6232	-0.37	1.3503	1.38

Source: Calculated using CHIP2007 and CHIP2013.

Note: 1.*,**,*** :statistical significant in 10%,5%,1% level.

2. The specification of strauctural MNL is similar to that shown in Table4, but dependent variable has only three categories(omitting the unemployed group) and the imputed wage differentials log(Woa/Wee) and log(Wer/Wee) are added to the regressors.All other independent variables shown in Table4 are also inculused here,but not shown.