〈論　　文〉

The urban wage gap and "*hukou*" system in China

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Abstract

This study investigates the determinants of the wage gap between migrants with rural *hukou* and local urban residents, focusing on the wage gap between and within the formal and informal sectors as well as the public and non-public sectors. The estimation results indicate that holding rural *hukou* status reduces the positive impact of formal sector employment on the wage rate; furthermore, the discrimination against migrants with rural *hukou* status causes their wage rate to be lower than that of urban residents with urban *hukou* status, even if their educational levels are the same.

Keywords : wage gap, rural *hukou* status, rural-urban migration, migrant discrimination

1. Introduction

Poverty in China has dramatically declined since 1980; however, in the process of rapid economic development (World Bank, World Development Indicators), income inequality has expanded, although it has started to reduce recently (Setsu, 2018).

A decomposition analysis of income inequality, in which indicators of inequality are decomposed between and within rural and urban areas, reveals that intra-urban inequality continues to rise, while the inequality between rural and urban areas and intra-rural areas has started to decline (Setsu, op cit.).

It is often pointed out that one of the factors accelerating intra-urban inequality in China is the wage gap between rural migrants (nōminkou) and local urban residents.

A great number of rural residents have migrated into the city for the purpose of earning higher incomes since the start of the Chinese economy's opening up in 1978 (Gen, 2009; Marukawa, 2013, ch.3). Although rural migrants can transfer their household registration (*hukou*) to the cities they migrate to, many migrants still maintain their rural *hukou* status, planning to return to their villages. This is because the process of transferring rural *hukou* is complicated owing to the higher *hukou* registration barriers in more developed cities and because such migrants risk losing

Table 1. Differences of Wage Rate between Rural Hukou Status Holder and Urban Hukou Status Holder

	Urban Hukou	Rural Hukou	Difference	t-value
Wage Rate (yuan/hour)	18.6	14.9	3.7	3.9***
Income (yuan/year)	39033.5	33376.7	5656.8	5.7***

Source) China Household Incpme Project (2013).
1) ***dinotes siginificance at 1% level.

their land tenure if they stay in urban cities for too long (Tyner and Ren, 2016; Chen and Fan, 2016; Cui and Cho, 2020; Wang et al., 2020; Zhang et al., 2020). Table 1 presents the income inequality in China by their *hukou* status.

Our study investigates the relationship between the wage gap and *hukou* registration, connecting two branches of literature.

The first branch attributes the wage gap unexplained by individual characteristics such as education, gender, and work experience to labor market discrimination against migrants who hold rural hukou (Frijters et al., 2010; Gravemeyer et al., 2010; Siddiquo, 2020; Lee, 2012; Meng, 2012; Song, 2014; Zhang et al., 2016; Dreger and Zhang, 2017; Pakrashi and Frijters, 2017; Zhang et al., 2018; Chen et al., 2019; Wang et al., 2020).

The second branch focuses on the wage gap between the formal and informal sectors, and the public and non-public sectors, and examines the negative relationship between formal sector employment and rural *hukou* status (Xue et al., 2014; Liang et al., 2016) and between public sector employment and rural *hukou* status (Siddique, 2020). Both branches suggest that the average wage of migrants who hold rural *hukou* is reduced by lowering the possibility of formal sector employment or public sector employment[1].

The first branch of literature does not take into consideration the wage gap between the formal and informal, or public and non-public sectors. The second branch does not consider the wage gap by *hukou* status within the sectors.

Accordingly, this study investigates the determinants of the wage gap between migrants who hold rural *hukou* and local urban residents, focusing on the wage gap between and within the formal and informal sectors, and public and non-public sectors. We also examine the impact of education on the wage rate, taking into consideration whether *hukou* status affects the impact. For that purpose, we analyze Chinese Household Income Project (CHIP) (2013) data, distinguishing the wage gap between

1 Dulleck et al. (2020) examine wage discrimination against household helpers who hold rural *hukou*, using an experimental game.

the sectors and within each sector.

The remainder of the paper is organized as follows: The next section explains the main variables and econometric models for the empirical study. The third section presents the estimation results. The final section concludes the paper.

2. Data and Econometric Model

Table 2 shows the descriptive statistics by *hukou* status from the CHIP 2013 dataset. According to this data, the percentages of female workers, and employees of individual enterprises and private enterprises are higher among workers who hold rural hukou. By contrast, the percentages of formal sector employees and public sector employees, educational level, health condition, communist party members, number of employees at the working unit, work experience in the current job, and number of other jobs tend to be lower for such workers.

To examine whether rural *hukou* affects formal sector employment, we estimate a probit model. To investigate the impacts of public sector employment, we estimate a

Table 2. Descriptive Statistics

Variable	All	Rural hukou		Other hukou			
	Mean	Mean	SD	Mean	SD	Difference	t
FORMAL (Labor contract = 1)	0.24	0.08	0.27	0.27	0.44	-0.19	-23.9 ***
Obs.	22,097	3,425		18,672			
Type1 (Public sector = 1)	0.21	0.06	0.24	0.24	0.43	-0.18	23.5 ***
Obs.	22,097	3,425		18,672			
Type2 (Foreign enterprises = 1)	0.02	0.01	0.12	0.02	0.13	0.00	1.0
Obs.	19,563	2,654		16,909			
Type3 (Enterprises = 1)	0.25	0.40	0.49	0.22	0.41	0.18	22.2 ***
Obs.	22,097	3,425		18,672			
Type4 (Others = 1)	0.53	0.53	0.50	0.53	0.50	0.00	0.5
Obs.	22,097	3,425		16,909			
Gender (Female = 1)	0.50	0.54	0.50	0.49	0.50	0.05	4.9 ***
Obs.	22,095	3,425		18,670			
Education (Educational years)	10.04	8.21	3.61	10.36	4.02	-2.15	-28.0 ***
Obs.	20,832	3,116		17,716			
Health: (1. Excellent-5. Very poor)	1.98	1.84	0.80	2.00	0.86	-0.17	-10.6 ***
Obs.	22,003	3,404		18,599			
Communist: (Communist party = 1)	0.15	0.04	0.39	0.16	0.75	-0.12	-20.1 ***
Obs.	22,097	3,425		18,672			
Scale: (1. Minimum - 7. Largest)	3.22	2.52	1.76	3.32	1.99	-0.80	-13.4 ***
Obs.	9,511	1,224		8,287			
Experience: (Working years)	15.61	11.44	94.32	16.40	98.74	-4.97	-2.0 *
Obs.	10,362	1,821		9,541			
Number of other jobs	4.94	4.92	0.57	4.95	0.46	-0.03	-2.5 **
Obs.	11,075	1,676		9,399			

Source) China Household Income Project (2013).

* Public sector includes state-owned enterprises, governments, and public enterprises.

multinomial logit model. The models shown in equation (1) can be estimated using the data in Table 2.

$$Y_{1i} = \delta_0 + \delta_1 \cdot X_i + \lambda \cdot Hukou_i + \varepsilon_{1i} \quad (1)$$

where $Y_{1i} = Formal_i$ (takes a value of 1 if the respondent has a labor contract) or $Type_{ji}$: types of employer (if the type of employer is public sector, foreign enterprise, or enterprises, the outcome variable takes a value of 1, 2, or 3; type of other employers, 4 is a base category). X_i represents individual characteristics (gender, educational years, work experience, political affiliation, health condition, number of employees in a work unit, and number of other jobs); $Hukou_i$ is respondent i's *hukou* type (rural hukou = 1); and ε_{1i} is an error term.

We also estimate the following OLS model to investigate whether *hukou* status affects the wage gap between and within sectors.

OLS model:

$$Y_{2i} = \beta_0 + \beta_1 \cdot Hukou_i + \beta_2 \cdot Y_{1i} + \beta_3 \cdot X_i + \beta_4 \cdot Y_{1i} \cdot Hukoui + \beta_5 \cdot X_i \cdot Hukou_i + \varepsilon_{2i} \quad (2)$$

where Y_{2i} is the wage rate and ε_{2i} is the error term.

We assume the negative coefficients of the interaction terms of the hukou dummy and sector dummies imply that even if workers belong to the same sector, the wage rate of those workers who hold rural *hukou* status is lower. Similarly, if the coefficients of the interaction term of the hukou dummy and individual characteristics are negative, it suggests that even if the rural *hukou* status workers have the same characteristics as local urban workers, their wage rates are reduced.

3. Estimation results

Table 3 shows the estimation results for Eq. (1). According to the results, rural *hukou* has a negative effect on formal sector employment and public sector employment.

For the other variables, we find that gender has a negative effect on formal sector employment, but no significant effect on public sector employment. In addition, more years of education and better health increase the probability of employment in both sectors. The number of employees at a working unit and work experience have a positive effect on both formal and public sector employment, while being a member of the Communist Party has a negative effect on employment in the formal sector and a positive effect in the public sector.

Table 4 shows the estimation results of Eq. (2). Column (1) in Table 4 shows the estimation results of the wage function with the formal sector dummy, while column (2) shows the results of the wage function with the public sector employment dummy.

The estimation results in column (1) show that the coefficient of formal sector

Table 3. Estimation results of formal-informal, or employment type selection functions

Dependent variable	FORMAL (Probit)			Type1			Type2 (Multinom inal logit)			Type3		
	coef.	Z		coef.	Z		coef.	Z		coef.	Z	
HUKOU	-0.223	-3.98	***	-0.641	-4.53	***	0.014	0.06		0.276	2.4	**
Gender	-0.07	-2.03	**	-0.061	-0.68		-0.16	1.1		-0.161	-1.93	*
Education	0.12	20.73	***	0.224	15.07	***	0.267	11.07	***	0.071	5.21	***
Health	-0.142	-6.11	***	-0.262	-4.55	***	-0.282	-2.84	***	-0.245	-4.57	***
Scale	0.158	16.98	***	0.582	18.8	***	0.752	17.92	***	0.204	6.77	***
Job	0.098	2.47	**	0.315	3.94	***	0.442	1.76	*	0.225	3.22	***
Experience	0.06	28.72	***	0.056	11.21	***	-0.041	-4.19	***	-0.033	-6.45	***
Experience2	-0.00003	-28.4	***	-0.00003	-11.1	***	0.00002	4.22	***	0.00002	6.38	***
Communist	-0.265	5.65	***	0.393	3.29	***	-1.333	-5.22	***	-1.052	-8.3	***
Type2	-0.173	-2.08	**									
Type3	-0.511	-13.54	***		Yes			Yes			Yes	
Regional dummy		Yes										
Cons.	-2.091	-8.93	***	-3.325	-6.38	***	-7.114	-6.14	***	0.533	1.14	
Obs.		8000						9054				
LR		3519.25						4666.54				
Pseud R2		0.3283						0.249				
Log likelihood		-3600.51						-7035.91				

Source) The authors'estim ation.
1) *** ,**, and * denote siginificance atthe 1%, 5%, and 10% levels.

employment is significantly positive, but the coefficient of the interaction term of the formal sector and rural *hukou* is insignificant. This indicates that there is a wage gap between the two sectors (but none within the sector) due to differences in *hukou* status.

The results in column (2) show that coefficients of public sector employment and the interaction term of the formal sector and rural *hukou* both are not significant. This implies that there are no wage gaps caused by *hukou* status both between the public sector and non-public sector and within the public sector.

In both column (1) and (2), the coefficients of *hukou* are insignificant. This implies that *hukou* status itself does not have any direct effect on the wage rate. Type 2 (Foreign enterprises) and Type 3 (Enterprises) tend to have higher wages than Type 4 (Others). For other personal characteristics, the gender wage gap is revealed. A larger number of employees at a working unit, as well as being a member of the Communist Party, also has a positive impact on wages.

The estimation results of both equations also show that while the coefficients of education are significantly positive, the coefficients of the interaction term of rural *hukou* and education are significantly negative. This suggests that, if migrants hold rural *hukou* status, the positive impacts of their education on the wage rate are reduced.

Table 4. Estimation results of wage function

Dependent variable（wag	(1).			(2).		
	coef.	t		coef.	t	
HUKOU	14.382	1.11		14.68	1.12	
FORMAL	3.353	7.39	***			
Gender	-3.198	-8.83	***	-3.23	-8.9	***
Education	1.31	21.57	***	1.42	23.65	***
Health	-0.498	-2.1	**	-0.616	-2.58	***
Scale	0.392	4.08	***	0.515	5.27	***
Job	0.117	0.26		0.186	0.42	
Experience	0.173	8.69	***	0.224	11.74	***
Experience2	-0.00009	-8.63	***	-0.0001	-11.64	***
Communist	0.891	2.03	**	1.034	2.34	**
Type1	0.301	0.43				
Type2	7.645	8.02	***	7.756	6.85	***
Type3	1.632	3.69	***	1.26	1.8	*
HUKOU *Gender	-1.54	-0.9		-1.526	-0.89	
HUKOU *Educ	-1.009	-3.26	***	-0.965	-3.18	***
HUKOU *Health	0.125	0.1		-0.019	-0.02	
HUKOU *Scale	0.112	0.21		0.0004	0	
HUKOU *Job	-0.407	-0.17		-0.587	-0.25	
HUKOU *Communist	0.147	0.67		0.184	0.06	
HUKOU *FORMAL	1.467	0.67				
HUKOU *Type1	0.785	0.29				
HUKOU *Type2	-7.782	-1.65	*	-5.779	-1.16	
HUKOU *Type3	0.556	0.31		1.028	0.45	
Regional dummy		Yes			Yes	
Cons.	-3.508	-1.39		-3.773	-1.48	
Obs.	7421			7421		
Ad.R^2	0.166			0.16		
P rob > F	0			0		

Source）T he authors ' es timation.

1）***,**,* indicates the estimated parameters are sigini.cant at the 1 % level, 5 % level 10 % level, respectively.

4. Conclusion

Discrimination against rural migrants in China has long been debated; however, existing studies have failed to consider the finer details that cause or affect this discrimination. In this study we used a novel method to consider factors previously ignored.

The estimation results indicate that holding rural *hukou* status has a negative effect on the wage rate by reducing the positive impact of formal sector employment on the wage rate. The results also indicate that discrimination against migrants with rural *hukou* status is reflected in the fact that their wage rate is lower than the wage rate of urban residents with the same level of education but who hold urban *hukou* status.

To the best of our knowledge, these findings are new.

We believe our study can contribute to the literature on wage gap due to discrimination against rural *hukou* holders in China.

Our findings suggest that wage rates of rural *hukou* holders are lower due to preference-based discrimination by employers. If this is the case, it is doubtful whether the current *hukou* reform policies instituted by the central government, which include removing restrictions on *hukou* registration) will be effective in reducing the wage gap motivated by discrimination. In our opinion, abolishing the distinction between rural and urban *hukou* status is the most effective policy to accomplish this, although we are not sure whether it will be possible for the Chinese government to implement this in the near future.

Finally, since we used CHIP 2013 data for the analysis, our study does not investigate the effects of *hukou* reform on the *hukou*-based wage gap after 2014, along with estimating the impact of *hukou* status differences on the wage gap with more recent data We leave this for future research.

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