

## Gender Wage Gap for Fresh College Graduates: Does It Exist Discrimination in Chinese Labor Market?

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**Abstract:** This study uses survey data of graduates from all Beijing universities in 2007 to examine male-female job-search difference and starting wage discrimination of graduates six months after graduation. It uses Weibull regression in parametric survival model due to a standard distribution of data, and Heckman selection model to examine Mincer and Polachek's theory of gender wage gap in employment because there exists a selection bias in the sample. The results show that gender gap exists both in the job searches and starting wages when female graduates enter the labor market for the first time. The findings indicate that female graduates have encountered gender discrimination in employment in the low-end labor market of China. Meanwhile there are differences in search behavior between males and females at their early job careers.

**Keywords:** Graduates, job search, starting wage, wage gap, gender discrimination

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### I INTRODUCTION

Gender wage gap is a common global phenomenon in the developed and undeveloped labor market. Several classic viewpoints are summarized in the following explanations. First, different wages between men and women reflect differences in productivity because of different human investment and career training (Olsen & Sexton 1996; Veum 1996; Crépon, Deniau & Perez-Duarte 2001; Weichselbaumer & Ebmer, 2005; Addabbo, Favaro & Magrini 2012). Second, the theory of compensating differentials predicts that dangerous and dirty job will offer a wage premium, for example, some males engage in the profession of truck driver with higher wages, and some females often own the secretary positions with lower wages (Polachek 1990; Schirle 2015). Third, the comparative advantages of women lies in home production or in the field of arts and social science, so their less market working hours or occupation congestion lead to less income compared with the males (Polachek 1978; Smith & Ward 1989; Kidd & Shannon 1996; Killewald & Gough 2013). Moreover, career discontinuity such as rearing children in woman's working period causes a gender wage gap (Mincer & Polachek 1974; Korenman & Neumark 1992; Wood, Corcoran & Courant 1993; Hansen 2000; Napari 2009; Bertrand, Goldin & Katz 2010; Cukrowska & Lovász 2014). Finally, discrimination causes gender wage difference (Neumark, Bank & Van Nort 1996;

Goldin & Rouse 2000; Hinks 2002; Bertrand, Goldin & Katz 2010; Heyman 2013).

However, the situation is complicated and ambiguous in the current transformed period of Chinese labor market. Before 1978 the whole society of China was dominated by command economy. Gender discrimination was regarded as the defects of capitalism. Even slight gender wage gap was removed and absolute equalitarianism was popular. However, after that time market economy was gradually dominated in daily life with Chinese economic reform and opening to the world. The problem of gender wage gap was emerging when the product market and labor market were established. Several studies present the gender wage gap in China and find that there existed different reasons such as productivity, social customs, paternalism, and discrimination (Meng 1998; Liu, Meng & Zhang 2000; Dong & Zhang 2009; Chen et al. 2013).

Jun KongThe main motivation for this study come from Mincer and Polachek's theory of gender wage differences in labor markets. They believe that discontinuity in woman's labor market attachments may explain a substantial part of the gender wage gap. This study uses data of college graduates half a year after graduation. The particularity of the data set lies in male and female graduates having the same human capital (four years of study) and no job experience, specifically there is no discontinuity in female labor supply. If

Mincer and Polachek's theory is correct, the gender wage gap should be very small at the beginning of employment when controlling other variables that affecting wages. If the gender wage gap exists significantly, then other factors may affect the gender wage gap.

Therefore, the logical purpose is to test the correctness of Mincer and Polachek's theory by the specific data set of college graduates. Min *et al.* (2006), Qing & Zeng (2009), Li & Peng (2011), and Zhang & Ying (2012) believe that the college graduate's starting wage gap is stemmed from discrimination when controlling the variables of productivity, profession, and industry in China. These previous studies used only graduate samples from several universities in dispersed regions, and thus their findings cannot at some extent represent the gender discrimination status of graduates in one entire area. For this reason, this study analyzes the employment status of graduates in Beijing through complete college data samples in 2007, and investigate further whether gender discrimination exists in employment.

The remainder of the paper is organized as follows. In Section 2, we review the literature on gender wage differentials, particularly in respect of college graduates, and outline the issues explored in this study. In Section 3, the survey data is introduced. In Section 4, we lay out the conceptual framework and econometrics model of the sample, and explain empirical specifications. In Section 5, we describe the data present descriptive statistics and report the empirical results. We conclude and discuss the analysis in Section 6.

## II LITERATURE REVIEW

Mincer and Polachek's theory shows that discontinuity in woman's labor market attachments may explain most gender wage gaps. Their theory and findings suggest discontinuity in female labor supply over the life cycle for two reasons. First, a wage differential is created because men tend to acquire more human capital. Second, the wage gap tends to increase in child-raising years because woman's skills tend to depreciate during that period.

In support of the theory, Korenman & Neumark (1992) explore several problems in drawing causal inferences from cross-sectional relationships between marriage, motherhood, and wages. They find both ordinary least squares cross-sectional and first-difference estimates understate the negative effect of children rearing on wages. Wood, Corcoran & Courant (1993) analyze the impact of labor market

experience on the gender wage gap by studying the post-graduation experiences of the University of Michigan law school classes from 1973 to 1975. They find about two thirds of the gender wage gap can be explained by differences in the work histories of male and female attorneys. Hansen (2000) also shows that woman's wages are significantly reduced by work absence and the distribution of the gender wage gap depends to a large extent on work absence. Napari (2009) points out that about 27% of the wage difference among the university graduates in Finland is caused by gender difference. Although the gender wage difference is only 10% during the early working periods, women suffer reduced wages and enjoy fewer promotion opportunities because of marriage and child rearing. Bertrand, Goldin & Katz (2010) point out that the lesser job experience, greater career interruptions and shorter work hours for the female MBA graduates are the main reasons of gender wage gap. Cukrowska & Lovász (2014) study the cases in Poland and Hungary, and find that most of the gender wage inequality is due to parenthood, both among women and men, constitute a significant part of the gender wage gap.

Although the evidence supports the theory, there is a heated discussion that the gender wage gap is explained by discrimination affecting employees even newly employed graduates. Neumark, Bank & Van Nort (1996) find that job applications from women had an estimated probability of receiving both an interview and a job offer that was significantly lower than man in an audit study of sex discrimination in hiring. Goldin & Rouse (2000) draw a similar conclusion in an analysis of the blind audition of symphony orchestras. Moreover, Hinks (2002) shows that white and Asian females suffer greater gender discrimination than their black and colored counterparts. In addition, some studies argue that there is gender discrimination in employment for graduates (Bertrand, Goldin & Katz 2010). The gender wage discrimination is changed with the change of competitive product market (Heyman 2013).

Furthermore, Meng & Miller (1995), Meng (1998), Liu, Meng & Zhang (2000), Demurger, Fournier & Chen (2006), Dong & Zhang (2009), Chen *et al.* (2013), and Dammert, Marchand & Wan (2013) analyze the gender wage difference in some industrial sectors in China and find that gender discrimination has different distributions among sectors. Regarding gender differences in job opportunities and initial wages for college graduates, Min *et al.* (2006) study the employment status of graduates in China in 2005 and find that male graduates find it easier to become employed (the contract rate of male graduates half a

year later is about 77.1% compared to 71.2% for female graduates) and their average monthly wage is RMB124 higher than that of the female.

Qing & Zeng (2009) report a lower employment rate and starting wage of female graduates, which is related to employability and internship experiences. Li & Peng (2011) demonstrate that gender discrimination, narrow social network, and insufficient educational quality, have a negative impact on the employment of female graduates. Chai & Deng (2011) confirm the existence of starting wage differences by Oaxaca decomposition among graduates, which is caused by the intensive employment of female graduates in low-paid industries and gender discrimination. Zhang & Ying (2012) reveal that female graduates have to search more job opportunities to find employment, which indicates that female graduates suffered gender discrimination during job searches.

Compared to previous studies in China, this study introduces the following specific aspects. First, we believe that Mincer and Polachek's theory cannot be applied to graduates' starting wages because female graduates have no discontinuity of work experience and other factors, such as discrimination, may affect the wage gap.

Second, most existing studies on university graduates' employment are based on only some Chinese universities, which show weakly for determining whether other universities also have gender discrimination in employment. Based on the complete employment data samples of all university graduates in Beijing in 2007, this study tests whether female graduates suffer discrimination in job opportunities and starting wages, thus allowing us to verify whether gender discrimination in graduate employment is relatively common in Beijing area owning a mature labor market.

Third, most previous research adopts Logit/Probit models and neglects descriptions of the job-search process. As a result, a parametric survival model (PSM) is applied in this study for a dynamic analysis of gender difference encountered by graduates during job searches and employment. Furthermore, to overcome the sampling deviation that may exist in the studies of Ji & Qin (2004), Min *et al.* (2006), as well as Qing & Zeng (2009), a Heckman selection model is applied to test and eliminate deviations. In addition, a Mincer wage equation is used to carry out quantitative analysis on gender differences and discrimination in the starting wages of college graduates. This study does not use the method that the wage and employment gap

decomposition need to take place in order to isolate the unexplained part of these gaps. Rather, a gender discrimination is verified by a significant comparison of wage and employment tested between the male and the female under controlling other variables representing production (Cain 1986). Meanwhile, the problem of selection bias is analyzed in the wage equation.

### III DATA INTRODUCTION

The data set is supplied by MyCos, an education consulting company. MyCos started a survey of college graduates over China in 2007. Known as the "Chinese College Graduates Employment and Skills Yearly Survey," it is designed to provide information about college graduates' job searches, initial wages, employment status, and builds on the national college graduates follow-up database posted on the China Survey Center website.

MyCos sends 25,000 survey invitation letters and online questionnaires to the target person's email box at response rate of 42.56%. MyCos sent the questionnaires used for our study in December 2007 and received feedback in February – April 2008. The Beijing data samples cover 82 colleges including research universities, universities, and colleges. This study uses the data set from Beijing colleges with valid samples of 6,103 graduates (female/male=3170/2933) in 2007.

### IV MODEL OF JOB SEARCH AND WAGE DETERMINATION

#### A. Job search model

PSM is applied to analyze the influencing factors of job search, such as university factors, individual characteristics of graduates, and labor market factors. Key attention is paid to the gender impact on job search.

PSM requires the job-hunting period to be subject to standard distribution. The employment rate can be expressed as

$$H(T_u) = \sigma \alpha (\sigma T_u)^{\alpha-1} \quad (1)$$

where  $H(T_u)$  represents the employment rate in  $T_u$ .  $T_u$  is job search time. This study defines the base time point of job search at 6 months before the graduation because some students had already become employed (or received internship opportunities).  $\sigma$  ( $\sigma > 0$ ) refers to the fixed employment rate. If  $\alpha > 1$ , the employment rate increases with time, known as the "snowball" effect. If  $\alpha < 1$ , the employment rate decreases with time. If  $\alpha = 1$ , the employment rate is

equal to  $\sigma$  during all periods. Generally,  $\alpha > 0$  in the model. The success rate of university graduates' employment is influenced by, for example, university factors, individual characteristics, and labor market factors. They affect the employment rate and job-hunting period through  $\alpha$ .

Relatively, the number of the undergraduate certificate owner is small which is approximately 8.9% of the population in China in 2007, far below the number of the developed countries. Hence, the employment rate for college graduates is high in every year. The sample covers 6103 graduates with 5534 (2830/2704) employed and 569 unemployed at the time of survey. Jobs requiring more than 4 hours' work per day are regarded as full-time jobs. According to the samples involved, several university graduates are employed from 5 months before graduation to 10 months after graduation.

Table 1. Employment distribution of male and female graduates in the job-search time.

Time (month)	Female graduates			Male graduates		
	E. number	E. rate (%)	Acc. Rate (%)	E. number	E. rate (%)	Acc. Rate (%)
1	62	1.96	1.96	58	1.97	1.97
2	119	3.75	5.71	85	2.90	4.87
3	130	4.10	9.81	91	3.10	7.97
4	145	4.57	14.38	77	2.63	10.60
5	151	4.76	19.14	105	3.58	14.18
6 graduation	490	15.46	34.60	439	14.97	29.15
7	638	20.13	54.73	760	25.91	55.06
8	443	13.97	68.70	525	17.90	72.96
9	211	6.66	75.36	189	6.44	79.40
10	104	3.28	78.64	108	3.68	83.08
11	111	3.50	82.14	82	2.80	85.88
12	79	2.49	84.63	79	2.69	88.57
13	59	1.86	86.49	44	1.50	90.07
14	63	1.99	88.48	44	1.50	91.57
15	24	0.76	89.24	15	0.51	92.08
16	1	0.03	89.27	3	0.10	92.18
Total	2830	89.27		2704	92.18	

Table 1 shows that the employment peak is usually concentrated in a few months before and after graduation. The employment rate after 16 months (10 months after graduation) are 89.27% and 92.18% for the female and the male respectively. The time of employment survey which is set in 6 months after graduation fits in the labor market of China. This situation is completely different from some previous studies. For example, Chevalier (2007) conducts a similar study in the UK used data from graduates who had graduated 42 months before the survey. The data includes many employed people who ever experience discontinuity of career.

Table 1 presents that the employed graduates are summarized monthly until the 16<sup>th</sup> month when the latest employment questionnaire is getting feedback. The employed graduates/total sample numbers is the employment rate. According to Table 1, no graduates are employed at 0 months (6 months before the graduation). However, graduates are employed gradually from the 1<sup>st</sup> month as the remaining graduates continue to hunt for jobs. Female graduates achieve a higher employment rate than male graduates during the first six months (before graduation). However, male university graduates achieve a higher employment rate after the 6<sup>th</sup> month (after graduation), especially during the 7<sup>th</sup> - 8<sup>th</sup> months. Subsequently, the overall employment rate of male graduates exceeds that of female graduates.

### B. Wage determination equation

Mincer (1974) believes wages are determined by education background and working experiences etc. Because most university students have no working experiences before graduation, the starting wage equation can be determined as:

$$\ln(W_i) = \beta_0 + \beta_1 \text{gender} + \gamma X_i + u_i \quad (2)$$

where  $\ln(W_i)$  is the logarithmic monthly wage,  $\beta_0$  is a constant term, and  $\text{gender}$  is the gender variable, which female is 1, and male is 0. As an independent variable,  $\beta_1$  describes the gender wage difference.  $X_i$  represents other explanatory variables that influence wages. As a control variable,  $\gamma$  is the coefficient vector of these variables.  $u_i$  ( $u_i \sim (0, \sigma^2)$ ) is a random error. When controlling for other explanatory variables, if the estimated value of  $\beta_1$  is significantly smaller than 0, female graduates suffer wage discrimination (Cain 1986).

In this study, samples are divided into two groups: employed graduates and unemployed graduates

(including graduates looking for jobs, those planning to take part in the postgraduate entrance exams or those going abroad). An OLS regression model deliberately chooses only employed graduates. The expected value of  $u_i$  is not 0. Therefore, the regression may produce selection bias. To solve this selection bias, this paper uses a selection model proposed by Heckman (1979).

V. GENDER DIFFERENCE AND GENDER DISCRIMINATION

A. Variables and statistical description

The explanatory variables of university graduates' employment are shown as following parts.

(1) universities. As a categorical variable, universities include research universities, universities and colleges. Majors, a categorical variable, include science, engineering, agriculture, medicine, law, business, social science, and others. (2) individual characteristics. This includes gender (categorical variable, female and male), age (numerical variable), and expected wage (numerical variable). (3) labor market factors. These include employers (categorical variable, including non-governmental non-profit organizations, state-owned enterprises (SOE), private/individual enterprises, government/public/research units, and joint venture/foreign-funded enterprises), employment region (categorical variable, including prefecture-level cities, provincial capitals, and municipalities), and scale of employer (categorical variable, including units with less than 500 employees and those with more than 500 employees).

This study emphasizes on the impact of gender on the employment rate. Age, universities, majors, employers, employment region, scale of employment unit and expected wage are used as control variables.

Table 2 represents the gender difference in the employment between male and female graduates. Viewed from the dependent variables, the average job-hunting period of male and female graduates is 7.21 months, which indicates that they obtain employment 1.21 months after graduating (the base time is 6 months before graduation). The average job-hunting period of male graduates is 0.12 months longer but their monthly wage is RMB327 higher than that of female graduates, and increases significantly compared with the starting wage difference of Min *et al.* (2006).

According to the independent variables, female graduates own a bigger number in employment (2830/2704), but lower employment rate than males significantly at 5% with a gap of 2.91%.

Table 2. Gender difference in employment between male and female graduates.

Variable types	Variable	Mean value	Employment rate difference between males and females	
Dependent variables	Job hunting period (month)	7.21	0.12**	
	Monthly wage half a year later (RMB)	3035	327***	
Independent variables	Gender percentage (female graduates)	51.14%	2.91%**	
	Research university	56.88%	12.65%***	
	University	36.65%	-14.82%***	
	Colleges	6.47%	2.16%**	
	Science	6.86%	2.13%**	
	Engineering	30.47%	26.06%***	
	Agriculture	1.28%	-0.12%	
	Medicine	0.89%	0.14%	
	Law	7.49%	-2.16%**	
	Business	26.32%	-8.09%***	
	Social science	25.50%	-17.08%***	
	Others	1.18%	-0.88%	
	Age	21.88	0.23***	
	Control variables	Non-governmental non-profit organization	1.46%	-0.796
		State-owned enterprises	31.34%	8.10%***
		Private/individual enterprises	27.60%	-0.63%
		Government/public/research units	15.38%	-1.4*
Joint venture/foreign-funded enterprises		24.22%	-5.20***	
Prefecture-level cities		11.91%	6.40%***	
Provincial capitals		9.84%	4.70%***	
Municipalities		78.24%	-11.10%***	
Units with less than 500 employees		37.35%	-7.40%***	
Units with more than 500 employees		62.65%	7.40%***	
Expected wage	1971.65	226.56***		

Note: \*\*\*, \*\* and \* represent significance within 1%, 5% and 10% confidence.

In addition, gender difference also can be observed in most control variables. Male graduates from research

universities and colleges achieve a higher employment rate than female graduates. However, in universities, female graduates achieve a higher employment rate. Male graduates of science and engineering have a higher employment rate, whereas female graduates of law, business, and social sciences have higher employment rate. No significant gender difference is observed in agriculture, medicine, and other majors.

Employed male graduates are 0.23 years older than female graduates. State-owned enterprises prefer male graduates, while government/public/research units, and joint ventures/foreign-funded enterprises prefer female graduates. No significant gender difference is observed in non-governmental non-profit organizations, and private/individual enterprises. Male graduates are employed more in prefecture-level cities and provincial capitals. Municipalities prefer female graduates. Male graduates have a higher employment rate in organizations with more than 500 employees but achieve a lower employment rate in organizations with less than 500 employees. The expected wage of male graduates is RMB226.56 higher than that of female graduates.

*B. Empirical results for job hunting*

According to data,  $\text{Log } H(T_u)$  is the linear function of  $\text{Log } T_u$  which is in line with Weibull distribution. Therefore, the influencing factors of employment rate are analyzed by Weibull robust regression in PSM. In Table 3, Regression show that the success rate of female graduates' employment is only 92.48% that of male graduates, and their job searching time remains 19.76% longer than male graduates. This indicates the slow marginal job-hunting of female graduates, which corresponds with Table 1, in which female graduates have a low average employment rate. There is not contradiction with a short average job searching time for females in Table 1. In regression, the employment success rate of graduates from universities is 90.46% that of research universities and their job-hunting period is prolonged by 25.51%. The employment success rate of graduate from colleges is 75.77% that of research universities and their job-hunting period is prolonged by 73.44%. Research universities enjoy good reputations in the labor market, as they are believed to possess high-quality capabilities, which results in high employment rates. Other explanatory variables have the different features that affecting job hunting of graduates.

Under controlling the explanatory variables, the gender variable influences both employment rate and the job-hunting period significantly. Although male and

female graduates have the same education background and no working experiences, female graduates have less job opportunities. This reveals the existence of gender difference in the employment of Beijing university graduates in the labor market. In addition,  $\alpha$  of the employment rate in Table 3 has a value larger than 1, which indicates that the employment rate of both male and female graduates increases with time, which is known as the "snowball" effect.

Table 3. Employment rate and marginal job hunting period of male and female graduates.

Variables	Weibull robust regression of employment rate	
	Coefficient of employment rate	Coefficient of marginal job hunting period
Gender (female)	0.9248*** (0.0267)	0.1976*** (0.0733)
University	0.9046*** (0.0284)	0.2551*** (0.0804)
Colleges	0.7577*** (0.0545)	0.7344*** (0.1992)
Other control variables	Yes	Yes
Sample size	5534	
$\alpha$ of employment rate	2.7912(0.0351)	

Note: \*\*\*, \*\* and \* represent significance within 1%, 5% and 10% confidence.

*C. Estimated results for gender starting wage*

The key of the Heckman selection model is to find an instrumental variable. It only affects the job search but exerts no impact on wages. In this study, "help" from the career service center of universities is taken as the instrumental variable [removed for blinding]. Career service center assist graduates to find jobs. Tips for resumes, job search methods, and interviews, as well as sponsored job fairs are supplied by the career centers to improve graduates' chances of finding jobs. While such assistance may increase the probability of graduates finding jobs, it does not affect graduates' first job wages.

This study uses two categories of instrumental variables to test selection bias. The first category comprises the instrumental variable: *Help* and *No Help*. *Help* means that graduates receive resume tips, job search method tips, interview tips, or a sponsored job fair from a career center, regardless of how many types

of help are received. For example, one graduate receives only resume tips from the career center. Another graduate may receive resume tips, job search method tips, and all other types of help from the career center. Both these cases are considered as *Help*. The second category comprises five instrumental variables: *Resume help*, *Method help*, *Interview help*, *Job fair help*, and *No help*.

The significance of the instrumental variables in regression is that they can be used to judge whether there is bias. If there is bias, then there is an inverse Mills ratio, which can be used to correct the bias of the selection equation. Therefore, the wage equation can estimate the starting wage difference accurately and assess whether there is gender discrimination in wages.

According to Table 4, the two OLS models in Table 4 apply the two instrumental variables to test their impacts on starting wages, but find no significant impact. However, in the Heckman selection model, these two instrumental variables influence the job search significantly. This indicates that these two instrumental variables only influence job search but have no impact on the starting wage, and thus, qualify as instrumental variables.

Table 4. Regression starting wage of OLS model and Heckman selection model.

Variables	OLS model		Heckman selection model	
	(1)	(2)	(3)	(4)
Gender (female)	-0.1048** * (0.0115)	-0.1049** * (0.0114)	-0.0922*** (0.0121)	-0.0922*** (0.0121)
Research university	0.2080** * (0.0260)	0.2090** * (0.0260)	0.2528*** (0.030)	0.2528*** (0.030)
University	0.0692** * (0.0270)	0.0724** * (0.0270)	0.1062*** (0.0232)	0.1062*** (0.0232)
College	---	---	---	---
Other control variables	Yes	Yes	Yes	Yes
Instrumental variable	Insignificant	---	Significant under 1% confidence	---
Instrumental variable	---	Insignificant	---	Significant under 1% confidence
$\lambda$ (inverse Mills)	---	---	0.2869 (0.0248)	0.2657 (0.0281)
LR test ( $\rho = 0$ )	---	---	Chi2(1)=10.26 Prob = 0.001	Chi2(1)=12.55 Prob = 0.000
Sample size	5534	5534	6103	6103

Note: \*\*\*, \*\* and \* represent significance within 1%, 5% and 10% confidence. Sample size: 6103 (Heckman selection model); Deleted samples: 569 (unemployment number).

The Heckman selection model (3) demonstrates that the first instrumental variable influences job search with 1% confidence but has no significant impact on the starting wage in OLS Model (1). The possibility for  $\rho = 0$  is 0.12%, indicating the existence of data selection bias. *Help* and *No Help* in the first instrumental variable can be used as effective instrumental variables and the selection equation can be used as the job equation. The Heckman selection Model (4) demonstrates that *Resume writing*, *Job search*, *Interviewing skills*, and *Job fair* in the third instrumental variable influence the selection model significantly with 1% confidence but have no significant impact on the starting wage in OLS Model (2). The possibility for  $\rho = 0$  is 0.06%, indicating the existence of data selection bias.

The Heckman selection model demonstrates that the starting wage of female graduates is 9.22% less than that of male graduates when taking selection bias into account. When neglecting selection bias, the OLS Model (2) concludes that the starting wage of female graduates is 10.49% less than that of male graduates. This indicates that the starting wage difference widens by neglecting selection bias.  $\lambda = 0.2657$ , namely, the inverse Mills ratio, indicates that the starting wage difference in considering selection bias is larger than that when neglecting selection bias, changing by  $e^{\sum \beta_i + \lambda - \sum \beta_j}$ . The wage in OLS and the Heckman selection equation is the logarithmic monthly wage and the real monthly wage is  $e^n$  (n is total effect of variables including gender variable). In OLS, the monthly wage is affected by various factors together ( $n = \sum \beta_i$ ), while in the Heckman selection equation, the monthly wage is influenced by  $\sum \beta_i + \lambda$ .

Under controlling the same variables, female graduates are always paid less during initial employment. This reveals the existence of gender discrimination in starting wages (9.22%). After controlling other variables, Qing & Zeng (2009) report that the starting wage of male university graduates is 12.1% higher than that of female graduates. Although they apply different samples and methods, they reach a similar conclusion, which indicates that female graduates suffer discrimination in starting wages. In addition, the starting wage of research university graduates is 25.28% higher than that of colleges and wage of university graduates is 10.62% higher than that of colleges, indicating the existence of a human capital effect.

## VI. CONCLUSION

This study finding contributes to further

understanding gender discrimination in employment of university graduates in China. Female graduates prefer to choose social sciences, and business that the initial job position is usually low-paid in business industry, which brings fiercer competition in these industries. This further decreases their starting wages and widens the gender wage gap. According to this study, female graduates prefer working for municipalities. Many of female graduates become employed before graduation, which implies unfairness in the job search and verifies that females have lower expected wages. Moreover, the current labor law cannot protect the female's interests because there is no detailed rules and regulations in China that punish discrimination in job searches and wages.

Controlling for influencing factors of job search and wage differences of university graduates except for gender, this study analyzes and confirms gender discrimination in employment of university graduates using PSM. Discrimination strength is measured by marginal effect. In addition, gender discrimination in the starting wages of university graduates and the strength thereof is studied by the Mincer wage equation and the Heckman selection model.

The study finds that both PSM and wage equation represent a lower employment rate and wages for female graduates compared with those of male graduates. Such a gap in the employment rate and wages has important statistical significance. It indicates that female university graduates in Beijing suffer discrimination in job opportunities and initial wages. Although female graduates have lower reservation wages, they nonetheless suffer from job-search difficulties. This result differs totally from conclusions in other countries (Bradley & Nguyen 2004) and confirms universal gender discrimination in employment of university graduates in China's labor market.

When evaluating gender discrimination in employment, if other variables are controlled, the job-hunting period of female graduates is prolonged by 19.76% compared with that of male graduates. When selection bias is taken into consideration, the starting wage of female graduates is about 9% lower than that of male graduates. This demonstrates that female graduates suffer discrimination in starting wages, shows an increasing wage gap trend, and reflects the existence of gender discrimination in China's low-end labor market. In addition, Female and male graduates have different preferences regarding job locations, employment organizations, and scale of organizations.

Although female and male graduates have the same education background and human capital without any discontinuity of work experience, female graduates nonetheless suffer discrimination in job opportunities and wages, which is the same as females at other stages of the work cycle. Thus, discontinuity of work experience cannot explain the gender wage gap for graduates as per Mincer and Polachek. Gender discrimination in employment develops from the gender gap in initial employment and starting wages. The subsequent lower wage of female workers is caused mainly by such a gender gap. During the later promotion of job opportunities and wages, although some female workers receive quick salary raises and their salaries exceed those of male workers, there is no statistical significance of these results. Most female workers continue to be paid less than male workers, even though they enjoy the same job opportunities and average wage increases. Thus, to narrow the gender wage gap, it is of primary importance to narrow the gender gap in initial employment and starting wages. Much research in the past decades has demonstrated that the gender employment gap exists continuously and is caused by discrimination. Discrimination is caused by various factors, such as society, culture, and market segmentation etc.

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