Job Search and Labor Market Outcomes of New Graduates in China: Using the Latest Available Survey Data

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*A*bstract: This is the first study that uses data collected after the new reform of the household registration system (*hukou*) on the topic of job search and labor market outcomes of new graduates in China. Data of recent years were collected via an original survey. Results indicate a significant, positive effect of search effort on finding a job, which was rarely observed before the reform. Furthermore, parents' income contributes significantly to starting wage, but has no significant effect on finding a job. This could be because parents' income is the source of major financial support for unemployed new graduates in China, theoretically contributing to wages but not affecting job-labor match. Moreover, the study examined details related to graduates' human capital and found that participation in university activities contributes to higher levels of starting wage upon graduation. The effects of different methods of job search were also examined. In addition, contrary to previous studies using data before the new *hukou* reform, this study found no significant wage gap between urban *hukou* graduates and rural *hukou* graduates.

Keywords: Job seeking; Search effort; Starting wage; Labor productivity; New graduate

JEL Classifications: J31, J71, R19

1. Introduction

Employment of new graduates has become an important issue for Chinese society. The number of university students increased sharply in recent years, followed by unemployment and stagnant wages for graduates (Bai, 2006). Furthermore, for a long time, China has been transitioning from a planned economy to a real labor market. Employment of new graduates in China has been affected by *hukou*, that is, the region where the person's household is registered. In most cases, this place of registration is the person's birthplace[1]. However, this system has been reformed in recent years by abolishing the distinction between urban and rural *hukou*. Based on the most recent data collected in 2013, we aim to provide new perspectives of the determinants of finding a job and starting wages of Chinese graduates.

Previous studies on job-search behavior and employment of university graduates were conducted based on data collected before the *hukou* reform (e.g., Li and Zhang, 2010; Li, Ding, and

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[1] *Hukou* is inherited from the previous generation, usually the mother. In most cases, it is the birthplace.   Sometimes it is not where the person born, for instance, if the person's parents are migrants from other regions with *hukou* of other regions, the person's *hukou* will be the same with them, not her/his birthplace. It is usually difficult for her/him to obtain a local *hukou*.

Morgan, 2009; Su and Zhang, 2015; Wang and Moffatt, 2008). Before the reform, the *hukou* system essentially split the population into urban and rural residents, providing rural *hukou* holders with access to land and urban *hukou* holders with urban social benefits (Melander and Pelikanova, 2013). Rural *hukou* holders often were discriminated against when they were looking for jobs in urban areas.   For instance, Wang and Moffatt (2008) used a questionnaire survey in 2005 and found that the starting wage of non-urban *hukou* graduates is significantly lower than that of urban *hukou* graduates.   However, after 2010, reform to the *hukou* system induced changes in the labor market. In particular, the reform abolished the distinction between urban and rural *hukou*, which was the basic cause of discrimination against rural *hukou* holders. Data for the current study, which were collected in 2013, show an insignificant gap in starting wages between urban-born and rural-born graduates, which is essentially different from previous studies.

Since the effect of academic achievement has been examined by many previous studies (e.g., Li and Zhang, 2010; Li, Ding, and Morgan, 2009), we put more effort into understanding the role of job-search behavior on employment and starting wages of Chinese new graduates. Search theory forms the basic notion of the theoretical background of this study. In a labor market with imperfect information, job seekers and job vacancies are not matched immediately but there is a process of search and matching. The urns-and-balls model[2] of search theory describes this process, and previous studies show that the probability of a job seeker finding a job increases with a greater level of his/her search intensity (Blanchard and Diamond, 1994; Cahuc and Zylberberg, 2004; Pissarides, 1979). Furthermore, the wage is determined by a Nash-bargaining game in which the worker and firm maximize each other's returns from employment (Pissarides, 2000). This wage model theoretically indicates that the wage level increases with the productivity of the worker and the benefit received when unemployed, which are two important factors examined in this empirical study.

Furthermore, different job-search methods could affect the worker's labor market outcome. Addison and Portugal (2001), using data from Portugal, found different effects of job-search methods on escape rates from unemployment; in addition, they found that wage outcomes of the labor market differ by workers' job-search methods. Furthermore, Kodama, Higuchi, Abe, Matsuura, and Sunada (2004) examined job changes of Japanese workers and found that different job-search methods have different effects on the period of finding a new job and the wages of the new job. Thus in this study, we also control for the effect of different job-search methods.

Moreover, when examining the role of human capital, we notice that except for academic achievement, there are other factors related to the potential of desirable qualities and skills of graduates. Li, Morgan, and Ding (2008) argued that potential employers tend to value experience in student societies or in voluntary social work, and tend to provide such students with higher starting salaries. Therefore, in this study, we introduce variables of activities undertaken in and outside of university, as well as being a student Communist Party member.

The remainder of the paper is as follows. Section 2 reviews the literature. Section 3 introduces the theoretical model. Data used to populate the model are discussed in Section 4. Section 5 reports the results produced by the estimation models. Finally, Section 6 concludes.

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[2] This model compares vacant jobs to "urns" and job applications to "balls" tossed at the urns by job seekers.   A particular job seeker simultaneously and randomly sends out a certain number of applications for the vacant jobs. A match occurs when a "ball" goes into an "urn."

2. Literature Review

There have been several previous studies on job search activities undertaken by Chinese university graduates. Different from the current study, data for these studies were predominantly collected up to 2005, before the *hukou* reforms implemented at the end of the 2000s[3]. Preceding the reform, individuals born in rural areas (and without a local city *hukou*) could not receive social insurance or public benefits in cities at that time. As a result, many enterprises hesitated to hire people without a local city *hukou*. In this way, prior to the *hukou* system was reformed, it led to discrimination against rural university graduates in the Chinese labor market.

Consistent with this pattern of discrimination, many researchers have found a wage gap between urban and rural *hukou* job seekers. Wang and Moffatt's (2008) analysis of pre-reform data showed that rural-*hukou* workers were paid less than their urban-*hukou* counterparts were. Li, Ding, and Morgan's (2009) findings indicate that graduates from big or mid-sized cities before entering university receive higher starting wages than others, other variables being controlled. In addition, Li and Zhang (2010) found that pre-college urban *hukou* status had positive impacts on a graduate's employment outcomes.

Furthermore, most previous research using data from that time did not find significant effects of job-search behavior on labor market outcomes of new graduates. For instance, Li, Morgan, and Ding (2008) found that neither graduates' personal search efforts, nor university-provided job-seeking instruction significantly affect job seeking. In addition, Li, Ding, and Morgan (2009) showed that minor, class rank, and matched job do not have significantly positive impacts on the starting wages of graduates in China. Li and Zhang (2010) did not introduce factors on job-search behavior when examining determinants of employment opportunity for graduates. Moreover, studies in Chinese, such as those of Zhou, Yue et al. and Yan et al. (as cited in Wang and Moffatt, 2008), reported that graduates' job search effort does not affect search outcomes. An exception is Wang and Moffatt (2008), who successfully provided evidence that effort invested in a job search is rewarded in the graduate labor market in China. In addition, they analyzed job offer acceptance; however, the key variable of reservation wage in job acceptance, although discussed in the theoretical background, was lost in the main regression work. The authors' data related to starting salaries (collected from three universities in Wuhan city) were recorded as interval data, with 305 observations in total. Nevertheless, they contributed to the literature by showing that the market functions of the Chinese labor market has shown greater development than in the past.

In contrast to previous work in this domain, we utilize data collected after the *hukou* reform. The most significant effect of the new *hukou* reform on the labor market was its reduction of discrimination against people with rural *hukou*. Once the reform was implemented, people with rural *hukou* were open to enjoy social welfare benefits that had previously been afforded only to city *hukou* holders. It became much easier for traditionally rural residents to move into urban areas for employment. As a result, employers' concerns regarding the instability of their employees were greatly reduced. Graduates with rural *hukou* were treated as equal to those with urban *hukou* when looking for jobs. In particular, it became easier for employers to provide excellent rural *hukou* graduates with high-wage jobs, which usually require on-the-job skill accumulation, and permanent employment, because the *hukou* reform made it easier for such graduates to reside permanently in cities. Kuhn and Shen (2014) observed that employers prefer non-local *hukou* workers to locals who are identically matched to the job's requirements; the authors argued that migrants' higher work

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[3] There were some small reforms during the 1980s–2000s; however, most were limited to small cities and special economic zones (The State Council, 2001).

hours and effort help to account for employers' preferences. These findings possibly would have been difficult to observe with *hukou*-based institutional factors that affected employer preferences in the past.

Note that even though the *hukou* reform has progressed over the study's sample period, the acceptance criteria of Chinese universities are still based on regional-level *hukou* with quota set for different *hukou* before the entrance examinations. Without considering the different numbers of test-takers from different regions, universities usually set a high quota for their local *hukou* test-takers. Thus, students whose *hukou* are in large cities, where most universities are located, usually enjoy a large quota set by the universities, which leads to a much higher acceptance rate and lower entrance requirements for them than those from small cities and villages (see also Fu, 2013).

Because of this unfair college admission system, the quality of students in the same university could differ across *hukou*, which probably further affects labor market outcomes when students graduate. Wang and Moffatt (2008) found that a non-urban *hukou* graduate is expected to receive more job offers than an urban *hukou* graduate with otherwise the same characteristics. They argue that one reason is the inequity in the Chinese higher education administration system, that is, the entrance requirements are higher for non-urban *hukou* holders; as a result, "it is reasonable to expect non-urban graduates to be academically stronger, on average, than urban graduates" (Wang and Moffatt, 2008, p.18). Although their interval data of wages did not provide evidence for that argument, we agree with their views and examine those effects using the most recent data.

Above all, given the impact that the reform to the *hukou* system has had on the Chinese economy, we evaluate the post-reform labor market, concentrating on the effect of new graduates' job-search behavior on labor market outcomes.

3. Model and Estimation

3.1 Predictors of finding a job

According to the urns-and-balls model of search theory, the probability of a new graduate *i* finding a job, M_i, increases with the search effort of the graduate, as follows (Blanchard and Diamond, 1994; Cahuc and Zylberberg, 2004; Pissarides, 1979):

$$M_i = s_i V\{1 - \exp[-(\bar{s}D/V)]\} / \bar{s}D \tag{1}$$

where s_i is the search effort of graduate *i*, measured by the number of job applications sent by the graduate; *V* is the number of vacant jobs in the graduate labor market, *D* is the number of new graduates who are looking for a job in the labor market, and $\bar{s}$ is the average search effort of all new graduates.

Thus, because the probability of a new graduate *i* finding a job increases with his/her search effort, as indicated by equation (1), we estimate a probit model of employment for graduate *i,* as follows (also refer to Greene, 2008, p. 773).

$$\Pr ob(employed = 1) = \Phi[\sigma + \delta\, S_i(search\_effort_i, search\_period_i, \\ search\_time\_per\_day_i) + \lambda C_i] \tag{2}$$

where σ represents constant terms for the total number of job vacancies, total number of job seekers, and average search effort among all job seekers in the labor market; δ and λ are coefficients. Furthermore, S_i is a set of variables associated with job-search behavior. Among these

variables, *search effort* is a theoretical variable measured by the number of job applications sent by the graduate. *Search time per day* (hours) and *search period* (months) are control variables incorporated into the model because even if two applicants send the same number of job applications, search effort may differ as a function of the time spent preparing and sending those applications.

Furthermore, C_i is a set of control variables associated with the graduate's characteristics, including sex, age, major, human capital factors, job search methods, and parents' income. Although a graduate's parents' income does not theoretically affect the graduate's match to a job, we include it as a control variable to control for its potential effects in an actual economy where job seekers are heterogeneous. For similar reasons, we also include human capital factors in the model to control for their effects. Factors related to the "human capital" variable include entering a short college, activities undertaken in universities, activities undertaken outside universities, vocational qualifications, prizes received while enrolled at a university, being a member of the Communist Party, and *hukou* status when entering the university. Details associated with the measurement of each of these factors will be reported in the next section. Finally, control variables related to job search methods include job seekers' social networks (*method_network*), attendance at university-held recruitment meetings (*method_in_university*), attendance at recruitment meetings held outside the university (*method_out_university*), and search behaviors on a job exchange (*method_job_exchanges*). As discussed in the Introduction, past studies have found that job-search methods affect job seekers' labor market outcomes (Addison and Portugal, 2001; Kodama et al., 2004).

3.2   Predictors of starting wage

To determine wages, we use Pissarides' (2000, p. 17) theoretical model. In this model, wages are decentralized by firms and workers, and are estimated as follows:

$$w = (1-\beta)z + \beta \ p(1+c\theta) \tag{3}$$

where w is the wage, β is workers bargaining power in relation to employers, z is the unemployment benefit, p is labor productivity, c is the rate of hiring cost, and θ is labor market tightness.

Assume a linear homogeneous Cobb–Douglas production equation, with given technology of capital ρ and technology of labor φ, and we obtain the following equation

$$p = Y(\rho K, \varphi L)/L = y(k, \rho, \varphi) \tag{4}$$

where K and L are aggregate capital and labor, respectively, and k is capital per capita.

Furthermore, we assume that the technology of labor, φ, is determined by the worker's human capital, h, as follows

$$\varphi = \varphi(h) \tag{5}$$

Accordingly, the wage equation becomes

$$w = (1-\beta)z + \beta \ y[k, \rho, \varphi(h)](1+c\theta) \tag{6}$$

Furthermore, because we examine a single group of job seekers who look for jobs in the labor market for new graduates, factors associated with the labor market and job vacancies are the same for all of them. These factors include labor market tightness, collective bargaining power with employers, technology of job capital, and the cost for hiring employees (for employers). Given that

they do not vary by job seeker, they are constant terms in the estimation equation presented here.

As a result, the wage regression equation is modeled as

$$wage_i = \alpha + \beta\, z_i + \eta H_i + \varepsilon_i \qquad (7)$$

where α represents constant terms related to the tightness of the labor market, bargaining power, capital technology, and hiring cost rate; and ε_i is an error term. z_i is the potential financial support received by graduate i if he/she becomes unemployed. Because new graduates in China rarely receive unemployment insurance benefits if they cannot find jobs, and most of them survive with financial support from their parents, we use parents' income, the average monthly income of the graduate's parents (*yuan*), to represent workers' potential benefits received when unemployed. In the current analysis, z_i is denoted as *parent income$_i$*.

Further, H_i represents a set of human capital variables for graduate i. These variables are related not only to the graduate's educational achievements but also to his/her abilities. They include the graduate's entrance into a short college, engagement in university activities, engagement in activities outside the university, vocational qualifications, prizes received during his/her time at the university, membership in the Communist Party, and *hukou* status upon entering the university.

First, because undergraduate students in China, which is our target population, take either a three-year specialized short course or a four-year full course, we include a dummy variable, *short_college,* in the model to indicate whether students graduated from the three-year course.

Second, students who participate in extracurricular activities or engage in social work are typically more skilled than those who do not. This is particularly true of students who have experiences or engage in work that is valued by employers (Li, Morgan, and Ding, 2008). To account for these abilities, we include three variables in the model: university activities (hours per month), extra-university activities (hours per month), and membership in the Communist Party.

Finally, we include participants' *hukou* status upon entering a university to control for *hukou*-based preferential treatment of urban *hukou*. Before entrance examinations each year, universities establish the number of students to be accepted on the basis of *hukou*. Entrance-exam takers in large cities (where many universities are located) are typically accepted at a higher rate than their rural counterparts are. For instance, in 2013, China's prestigious Peking University in Beijing set a quota of 136 students from local Beijing *hukou*, but only 10 from nearby Hebei *hukou* (China Education Online, 2013). This is a considerably weighted quota, given that 72,700 exam-takers were from Beijing *hukou* and 449,800 were from Hebei *hukou*[4] (SINA, 2013). These figures indicate that the acceptance rate for new entrants to Peking University was 83 times higher for Beijing *hukou* students than for Hebei *hukou* students. This unequal treatment could lead to variations in student quality across *hukou*. Bai, Chi, and Qian (2014) found that across all universities, scores on the National College Entrance Examination significantly predict undergraduate grade point averages (GPAs) for all four years in college. In addition, Li and Zhang (2010) found that graduates with better college GPAs were more likely to be employed. Given the impact that *hukou* has on these outcomes, we include a variable in the model to control for its effect.

Given the above, the equation for estimating an employee's starting wage is:

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[4] These data are available at http://www.eol.cn/html/gkcx/fsx/31.htm, and
http://edu.sina.com.cn/gaokao/2013-05-09/1441379477.shtml.

$$wage_i = \alpha + \beta parent\_income_i + \eta H_i(short\_college_i, qualification_i, prize_i,$$
$$activity\_in\_university_i, activity\_out\_university_i, hukou_i) + \varepsilon_i \qquad (8)$$

4. Data

We conducted a survey and collected data from four universities in China's Liaoning Province in June 2013, the last month before graduation. Liaoning Province is an industry center in the northeast of China[5], with many state-owned enterprises (SOEs) and other firms that attract graduates from local universities. The Government of Liaoning Province announced it would not distinguish between urban and rural *hukou* in 2009 (Liaoning Provincial Government, 2009), four years before our survey was conducted. Our questionnaires were given to all new graduates in the undergraduate schools of those universities, and 3,850 were answered and returned.

We carefully collected and cleaned the survey data. To obtain the most accurate values, data for wages are the wage that appears on the signed employment contract of the graduate. Furthermore, to exclude people who have not engaged in job search, the observations of students that would continue studying in graduate schools or abroad after graduation, or students who were preparing to start their own businesses, were deleted, leaving samples of only students that were searching for jobs as employees[6]. Moreover, *hukou* refers to pre-university *hukou* status because students receive temporary local *hukou*, which is limited in the university period, while what matters for university acceptance and the job market is the original pre-university *hukou*.

Our data are credible for research purposes. There is much evidence to support them. First, the average level of wages among the sample is 2423 *yuan*, which is almost the same level as a national survey of 2013 new graduates (2,119 yuan on average), conducted by Ganji Co. (2013). In addition, the average rate of finding a job was close to that of a national survey of 2013 new graduates (91.8%) conducted by MyCOS Research Institute (2014). Furthermore, parents' monthly income is consistent with the reality of China: it is much higher for urban *hukou* graduates than rural *hukou* (4330 *yuan* for the former and 2532 *yuan* for the latter, on average).

Descriptive statistics are reported in Table 1. Furthermore, data statistics for urban *hukou* and rural *hukou* graduates are shown in Table 2. Note that in Table 2, there is no significant difference of average wage level between urban and rural *hukou* graduates. Although urban-born graduates send more applications than rural-born graduates do, urban *hukou* have a lower proportion of receiving at least one offer; a stark gap is parents' income, which is 4,330 yuan for urban *hukou* graduates and 2,532 yuan for rural *hukou* graduates. In addition, we examined the correlation between *hukou* (the administrative rank of the household registration) and other variables, and found similar results: a positive correlation between *hukou* and application, a negative correlation between *hukou* and *job_found*, and a positive correlation between *hukou* and *parents_ income*. Based on those data, we examine determinants of finding a job and the starting wage of new graduates in the following Section 5.

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[5] Liaoning ranks among the top three provinces in China in production of pig iron, steel, and metal-cutting machine tools. Liaoning is one of the most important raw material production bases in China.

[6] This does not cause problems related to sample selection because graduates who have not searched for a job are not within the population on which we focus in this study.

Table 1. Descriptive statistics

Variable	Effective N	Mean	Std. Dev.
Job_found	2042	0.94	0.24
Wage	1989	2423.89	1373.19
Application	2468	8.47	11.78
Search_period	2199	5.99	3.93
Search_time_per_day	2554	8.30	10.46
Method_network	2578	0.44	0.50
Method_in_university	2577	0.81	0.39
Method_out_university	2580	0.29	0.46
Method_job_exchanges	3850	0.19	0.39
Method_determined_network	3850	0.09	0.28
Parent_income	2931	3695.90	3167.18
Short_college	3023	0.33	0.47
Male	3092	0.78	0.41
Age	3092	21.86	1.00
Hukou	3086	2.81	1.56
Nature_science	3117	0.88	0.33
Qualification	3134	0.63	0.48
Prize	3126	0.62	0.48
Party_member	3112	0.22	0.42
Activity_in_university	3113	3.44	4.58
Activity_out_university	3098	2.88	4.28
SOE	3850	0.22	0.41

Notes: *job_found* represents whether the student has received at least one offer after applying for a job (Yes=1, No=0). *Hukou* is the administrative rank of the household registration of the graduate when she/he takes a university's entrance exam. Students can have a *hukou* status of one of six types: four big cities controlled by the central government (*hukou*=6), cities that are administrative centers of provinces (*hukou*=5), general cities (*hukou*=4), town-level cities (*hukou*=3), towns (*hukou*=2), and villages (*hukou*=1).

Table 2. Data for urban *hukou* and rural *hukou* graduates

Variables	H0: diff=0	Urban_born			Rural_born		
	t-value	N	Mean	Std. Dev.	N	Mean	Std. Dev.
Job_found	[-4.27]***	1255	0.93	0.26	787	0.97	0.18
Wage	[-0.30]	1229	2417	1461	760	2435	1219
Application	[1.33]*	1570	8.70	11.79	898	8.05	11.78
Search_period	[-3.65]***	1387	5.75	3.88	812	6.39	3.97
Search_time_per_day	[-0.48]	1618	8.22	10.08	936	8.43	11.09
Method_network	[2.12]**	1639	0.46	0.50	939	0.42	0.49
Method_in_university	[-5.91]***	1639	0.78	0.42	938	0.87	0.34
Method_out_university	[0.08]	1641	0.29	0.46	939	0.29	0.46
Method_job_exchanges	[-4.12]***	2775	0.17	0.38	1075	0.23	0.42
Method_determined_network	[-2.39]**	2775	0.08	0.27	1075	0.11	0.31

Parent_income	[17.43]***	1897	4330	3450	1034	2532	2124
Short_college	[-6.35]***	1988	0.29	0.46	1035	0.41	0.49
Male	[-6.49]***	2032	0.75	0.43	1060	0.85	0.36
Age	[0.65]	2025	21.87	1.00	1067	21.84	1.01
Hukou	[122.07]***	2011	3.78	1.02	1075	1.00	0.00
Nature_science	[-5.62]***	2047	0.86	0.35	1070	0.92	0.27
Qualification	[-2.71]**	2062	0.62	0.49	1072	0.67	0.47
Prize	[0.52]	2056	0.63	0.48	1070	0.62	0.49
Party_member	[7.41]***	2043	0.26	0.44	1069	0.15	0.36
Activity_in_university	[-0.70]	2048	3.39	4.58	1065	3.52	4.58
Activity_out_university	[1.47]*	2041	2.96	4.34	1057	2.73	4.16
SOE	[-4.73]***	2775	0.20	0.40	1075	0.27	0.45

5. Results of Estimation

Estimation results are reported in Tables 3 and 4. In the results for the determinants of finding a job (Table 3), we found that the number of applications and the length of job-search periods both have significant positive effects on employment. This indicates that engaging in more job search effort increases the probability of being matched to new jobs, which is consistent with search theory. As outlined above, most previous studies have not observed a significant effect of job search effort; this is likely attributable to the fact that of these studies were performed before the implementation of the *hukou* reform. At that time, discrimination based on *hukou* status was pervasive, effectively negating any potential impact of a job seeker's effort on securing a job.

Analysis of the control variables shows that attending recruitment meetings held at the university has a significant positive estimated coefficient, while other job-search methods, such as using social networks, do not have significant effects. This indicates that the formal job search method for graduates (i.e., recruitment meetings held at universities) is the most effective way to find a job. Although nearly half of students use social networks to search for jobs, the effect of this method is weaker (and less significant) than that of university recruitment meetings. This is consistent with previous research on other countries that has shown differential effects of job-search methods on securing employment (e.g., Addison and Portugal, 2001; Kodama et al., 2004).

Furthermore, we found that *hukou* has a significant negative effect on employment, indicating that it is easier for graduates born in rural areas and small cities to find jobs than those born in large cities. This suggests that graduates born in rural areas and small cities could have some advantages that are valued by employers (e.g., greater ability) compared to graduates born in large cities. Note that this is not an advantage of *hukou* because a job does not benefit by a worker being born in a rural area. In addition, the advantages to rural-born graduates are not caused by their greater readiness to accept low-wage jobs. One reason that such readiness does not matter is that the dependent variable is whether the graduate has received a job offer, which occurs one step before job acceptance. The other reason is that the actual starting wage of rural-born graduates is not lower than that of urban-born graduates in the sample. This result is fundamentally different from results produced by Wang and Moffatt (2008). We argue that this result may be due to differing qualities of students, because the qualifying score is higher for students born in rural areas and small cities according to the unequal university admissions system in China. This likely led to a higher quality of students among those born in rural areas and small cities.

Table 3. Determinants of finding a job (Dependent variable: Job_found)

Variables	Model (1)	Model (2)	Model (3)	Model (4)	Model (5)
Search effort	0.02 [2.39]**	0.02 [2.33]**	0.02 [2.36]**	0.02 [2.06]**	0.01 [1.51]
Search_period	0.03 [1.89]*	0.04 [2.17]**	0.04 [2.14]**	0.03 [1.49]	0.03 [1.43]
Search_time_per_day	0.01 [0.82]	0.01 [0.71]	0.004 [0.61]	0.003 [0.37]	0.002 [0.26]
Parent_income	-0.00002 [-1.09]	-0.00002 [-0.92]	-0.00002 [-0.89]	-0.00001 [-0.50]	-0.00001 [-0.51]
Male	-0.55 [-2.63]***	-0.55 [-2.62]***	-0.54 [-2.57]**	-0.61 [-2.72]***	-0.61 [-2.69]***
Age	0.12 [1.50]	0.10 [1.26]	0.10 [1.18]	0.12 [1.44]	0.12 [1.39]
Nature_science	0.88 [4.11]***	0.91 [4.23]***	0.90 [4.11]***	0.76 [3.28]***	0.80 [3.40]***
Hukou	-0.13 [-2.66]***	-0.13 [-2.75]***	-0.13 [-2.74]***	-0.12 [-2.46]**	-0.12 [-2.42]**
Short_college	0.29 [1.48]	0.23 [1.17]	0.21 [1.06]	0.20 [0.94]	0.16 [0.76]
Activity_in_university		0.03 [1.36]	0.02 [1.19]	0.03 [1.44]	0.03 [1.37]
Activity_out_university		-0.01 [-0.62]	-0.01 [-0.60]	-0.01 [-0.38]	-0.01 [-0.30]
Qualification			0.04 [0.28]	0.03 [0.22]	0.04 [0.23]
Prize			0.11 [0.74]	0.02 [0.13]	0.02 [0.12]
Party_member			-0.11 [-0.62]	-0.09 [-0.47]	-0.09 [-0.49]
Method_network				0.12 [0.82]	0.10 [0.64]
Method_in_university				0.76 [4.89]***	0.77 [4.84]***
Method_out_university					0.23 [1.34]
Method_job_exchanges					0.24 [1.34]
Constant	-0.93 [-0.52]	-0.59 [-0.32]	-0.52 [-0.28]	-1.44 [-0.76]	-1.44 [-0.76]
University dummies	Yes	Yes	Yes	Yes	Yes
Observations	1418	1402	1388	1380	1379
Log likelihood	-209.76	-204.91	-204.09	-192.00	-189.73
Adjusted R^2	0.12	0.13	0.13	0.18	0.19

Notes: The dependent variable is whether the graduate has received at least one offer after job application. *Job_found* = 1, if Yes; *Job_found* = 0, if No.

t-statistics in parentheses indicates statistical significance, * p<0.10, ** p<0.05, *** p<0.01

In the results associated with wage determination, we found that, as expected, parents' income, the major source of financial support if the student cannot find a job upon graduation, has a very significant positive effect on wages. This finding is consistent with the theoretical model, that is, a greater expectation of financial support from the state for unemployment enables the graduate to be more patient and wait for a high-paid job, leading to a higher level of bargaining wage. Note that parents' income of rural-born graduates is much lower than that of urban-born graduates in China, which could lead to a smaller effect of parents' income on the wages of rural-born graduates.

With respect to factors related to labor productivity, we found no significant effect of obtaining a vocational qualification, receiving a prize during university studies, or being a Communist Party member on initial wage rate[7]. This is consistent with findings produced by Li, Ding, and Morgan (2009), who found that pursuing a minor course of study or having a higher-class rank do not significantly affect the starting wages of Chinese graduates. The non-significant relationship between academic results and starting wages may be because university graduates typically do not need outstanding academic achievement, and the academic level of only receiving a university degree may be sufficient for the graduate's first job. Therefore, employers could pay more attention to graduates' personality characteristics, such as cooperation and diligence, which is associated with experiences in student societies or volunteer work, as argued by Li, Morgan, and Ding (2008). Their argument might be valid, given the significantly positive coefficient associated with *activity_in_ university* in our results, which indicates that students who undertake activities at university could receive higher starting wages upon graduation.

Moreover, we found that *hukou* has a significant negative effect on wage determination. Specifically, results show that graduates from rural areas and small cities receive higher starting wages than their counterparts from large cities do. The reason could be that the average achievement of entrance examinations of students born in rural areas or small cities is higher than that of those born in large cities; therefore, rural-born students could represent a higher level of human capital, which leads to higher starting wages when they graduate. This finding differs from most previous research, which has largely found graduates from urban areas tend to receive higher wages (i.e., Li and Zhang, 2010; Li, Ding, and Morgan, 2009; Wang and Moffatt, 2008). Still, this discrepancy is likely due to these studies being performed before reform to the *hukou* system.

In addition, the result indicates that graduates who find jobs in SOEs receive a higher level of wages. The reason could be that SOEs are financed by the government and usually have access to more capital in China, which leads to a higher ratio of capital per worker, thereby increasing labor productivity and contributing to wages, as indicated by the theoretical analysis (equation (6)).

For the control variables in wage estimation, the result indicates that a student whose job search from start to finish is longer could find a high-wage job. The reason could be that the probability of meeting a high-wage vacancy is higher if the job-search period is longer, given a fixed length of university years.

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[7] A usual problem when examining returns on education modeling is the causal effects of educational attainment. However, we did not examine this factor for several reasons. First, the study features a model related to job-search behavior; all respondents are undergraduate students of a similar education level. As such, we were unable to perform an analysis of graduates of different education levels. Second, we included some variables related to workers' expected labor productivity into the model (e.g., three-year course i.e., short_college), vocational qualification, and prizes received during one's time at university. Results show that none of these factors is a significant predictor of wages. As such, they do not introduce bias into the model.

Furthermore, we found no significant effect of a graduate's use of his/her social network on the graduate's first wages. This is partly consistent with Wang and Moffatt (2008), who found no significant results for the association between various job search methods (including the use of social contacts) and starting wages in China. However, our results further indicate that a graduate could find a higher-wage job if he/she conducts job searches via recruitment meetings at universities. It is possible that representatives for employers that pay high wages are concentrated at these university-sponsored recruitment meetings.

Table 4. Determinants of starting wage (Dependent variable: Starting wage)

Variables	Model (1)	Model (2)	Model (3)	Model (4)	Model (5)
Parent_income	0.10 [8.41]***	0.10 [8.30]***	0.12 [8.77]***	0.12 [8.90]***	0.13 [9.01]***
SOE	240.24 [3.45]***	231.36 [3.28]***	213.51 [2.64]***	196.14 [2.41]**	180.38 [2.21]**
Short_college	-20.94 [-0.23]	-1.51 [-0.02]	-110.88 [-0.99]	-92.07 [-0.81]	-99.13 [-0.87]
Hukou	-93.72 [-3.92]***	-94.74 [-3.91]***	-107.37 [-3.83]***	-99.08 [-3.53]***	-99.30 [-3.54]***
Nature_science	83.89 [0.69]	115.98 [0.93]	182.57 [1.25]	119.37 [0.81]	89.94 [0.60]
Activity_in_university	14.59 [1.77]*	14.45 [1.71]*	22.22 [2.28]**	23.89 [2.44]**	25.10 [2.56]**
Activity_out_university	6.30 [0.76]	5.48 [0.64]	2.05 [0.21]	2.76 [0.28]	1.48 [0.15]
Male	138.17 [1.41]	135.02 [1.35]	61.54 [0.53]	57.50 [0.49]	55.34 [0.48]
Age	-33.81 [-0.88]	-34.93 [-0.89]	-76.47 [-1.70]*	-73.06 [-1.63]	-69.72 [-1.55]
Qualification		-61.10[-0.82]	-39.68[-0.46]	-77.61[-0.90]	-82.52[-0.94]
Prize		41.05 [0.54]	15.40 [0.18]	2.65 [0.03]	1.35 [0.02]
Party_member		61.32 [0.67]	103.67[0.99]	116.91[1.11]	116.04[1.11]
Search effort			0.27 [0.08]	-0.46 [-0.13]	1.00 [0.28]
Search_period			20.60 [1.85]*	18.66 [1.68]*	20.00 [1.79]*
Search_time_per_day			0.53 [0.13]	0.40 [0.10]	0.86 [0.21]
Method_network				-27.19[-0.32]	-16.68[-0.20]
Method_in_university				407.59 [3.63]***	378.76 [3.34]***
Method_out_university					-15.28[-0.18]
Method_job_exchange					-181.8[-1.92]*
Method_determined_network				82.70 [0.65]	76.72 [0.60]
Constant	2980.64 [3.43]***	2983.35 [3.39]***	3711.13 [3.67]***	3361.15 [3.30]***	3378.98 [3.32]***
University dummies	Yes	Yes	Yes	Yes	Yes
Observations	1679	1658	1380	1374	1374
R^2	0.08	0.08	0.09	0.10	0.10
Adjusted R^2	0.07	0.07	0.08	0.08	0.09

*Notes***:** The dependent variable is the starting wage appearing on the job contract.

t-statistics in parentheses indicates statistical significance, * p<0.10, ** p<0.05, *** p<0.01

6. Concluding Remarks

This study examined determinants of job finding and starting wage levels of new graduates in China. Data were collected after the new reform of *hukou*, via a survey conducted in four universities in Liaoning Province in northeast China. We found that search effort, measured by the number of job applications sent by graduates, has a significant positive effect on employment. Moreover, parents' income could lead to higher starting wages of graduates because of the role such income plays as a financial support for unemployed Chinese new graduates. Furthermore, there is no significant wage gap between rural and urban *hukou* graduates in the sample. Rural *hukou* graduates could even have an advantage in being more valued by employers, possibly due to differing student quality owing to China's *hukou*-based university admission system.

Furthermore, we examined details of human capital of graduates and found that participating in university activities contributes to higher levels of starting wage upon graduation. In addition, we examined different methods of job search, and found that searching for jobs via recruitment meetings held at universities could be the most effective way to find a job and receive higher wages. Moreover, even though many students use the method of social network to search for jobs, we did not find significant contribution from this method to job finding and wages.

A limitation of the current study is that we did not examine the step after finding a job, that is, the acceptance of job offers, due to lack of data on the key variable for that analysis, the reservation wage. Furthermore, data for the study were gleaned from an original survey conducted in a representative region of China. To the best of our knowledge, no such national survey of job-search behavior of new graduates has been conducted since the new *hukou* reform.

Nevertheless, this analysis provides new evidence of the role of job-search effort and parents' income on finding a job and the starting wage of Chinese graduates, based on the latest available survey data. Furthermore, results suggest that providing more job search assistance and building an unemployment insurance system for new graduates could improve their labor market outcomes, which could help policymaking.

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