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Abstract

We assess the unemployment duration-dependent impact of the 2008 Labor Contract Law on job finding probabilities and subsequently job-match quality, including job security, wages and employer-provided social insurance. Dynamic endogeneity underlying individuals' sequential labor market outcomes is addressed by sharp regression discontinuity and correlated individual unobservables settling into non-parametric joint distribution. The law protracts employment only in the short-term. After job match, the law stabilizes employment and increases wages and insurance coverage, all in the short-term with substantial differences between urban locals and migrant workers and heterogeneity in gender.

Key words: unemployment, wage, social insurance, regression-discontinuity design, China
JEL classification: J64, J65, C41, O53

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1. Introduction

The socialist system in 1980s and 90s labor markets in urban China privileged urban residents (those with urban household registration, *Hukou*) by assigning permanent jobs in state or collective sectors and prohibiting job mobility. Consequently, this is referred to as the "iron rice bowl" period. To limit inefficiency caused by *de facto* lifetime jobs, a labor law permitting short-term contracts, regulation of employment relations and minimum working conditions took effect in 1995 together with the restructuring of the state and collective sectors. Between 1995 and 2000, 31.6 million and 16.5 million workers were laid off from the state and collective sectors, respectively, equaling a quarter of the 1995 urban labor force.[1] Draconian labor retrenchment caused unemployment of an average 19 months suppressing wages by 16% for this unemployment period, especially for women (Knight and Li, 2006). Urban labor markets also became less formalized as it was common for employers to re-hire the laid-off workers on an informal basis (Cai *et al.*, 2008). According to Friedman and Lee (2010), only half of enterprises signed contracts with employees by 2007 and this proportion was much lower for non-state sectors (20%) and migrant workers (12.5%). The low contract rate, especially in the non-state sectors (less than 20%), together with the fact that more than 60% of contracts were short-term (less than one year), were also reflected in a survey of 31,000 employees across 7 provinces, both of which were conducted by the National People's Congress of China in

[1] Authors' calculation based on data from China Statistical Yearbook 2001 published by the National Bureau of Statistics (NBS).

April 2005.[2] Meanwhile, rural-to-urban migrant workers rarely had social insurance. In Lu and Song's (2006) survey in Tianjin which is only about 100km from the capital city, few migrants had medical insurance (14.3%), pension (8.6%) or unemployment insurance (7.3%) in contrast with high insurance coverage among urban workers – 68.2%, 63.8% and 51.8%. Consequently, loss of formalization and limited protection of workers have become salient in urban labor markets (Park and Cai, 2011).

The Chinese government enforced the new Labor Contract Law (LCL) from January 1st, 2008 to halt the trend of informalisation of the urban labor market (Gallagher *et al.*, 2013). Policy was to institutionalize labor conflict resolution and ease labor relations (Gallagher and Dong, 2011) through legislation and arbitration (Friedman and Lee, 2010). There are two primary goals underlying the passage of the law: to protect workers' rights by mandating labor contracts and by regulating the contract amendment, conversion and termination. This causes Chinese employment protection legislation (EPL) to be the 3rd strictest among the OECD countries (Gallagher *et al.*, 2013). Secondly, the LCL dedicates to improving employees' social protection. As reviewed by Freeman (2010), EPL for developed (typically OECD) countries has tilted market outcomes towards incumbent workers without a clear aggregate influence on employment, while the impact in developing countries remains ambiguous and highly sensitive to country-specific contexts (e.g., the tightness of labor markets and strength/enforcement of EPL). Using the 2008 EPL in China, this paper aims to offer a *dynamic* and *causal* assessment of the implementation of LCL on workers' unemployment duration dependent labor market outcomes in terms of their job-finding rates and the subsequent job-match quality including job security, wages and the likelihood of obtaining employer-provided social insurance.

[2] The report is accessible at http://www.npc.gov.cn/npc/zt/2005-12/29/content_343899.htm (in Chinese, accessed 29 January 2016).

2. Review of new Labor Contract Law and its consequences in urban labor markets

For appointments after January 1st, 2008, the articles of LCL relating to the first primary goal include: mandatory contracts for all kinds of labor; specified probationary periods of 1 to 6 months according to the length of the contract and entitlement to a single probationary period from the same employer. This restriction is intended to prevent employers exploiting workers by extending probation(s) and then terminating the employment. Those on temporary one-year contracts will be able to convert their contracts to permanent ones and those who have worked for the employer for a decade or completed two consecutive fixed-term contracts will be automatically offered open-ended contracts. Severance pay is required unless the employee refuses to renew the contract; this payment, for lawfully terminated contracts, is as much as 12 times the employer's monthly salary during his/her employment duration or 12 times 300% of the local average monthly salary, and is doubled for unlawfully terminated contracts, which makes labor reallocation much more costly than before. The employer is required to submit layoff plans to the labor administrative department explaining the situation to the labor union or to all employees 30 days in advance if dismissing more than 20 persons or over 10% of the total workforce. This introduces high fixed firing costs as well as social insurance. To realize the second primary goal, the LCL stipulates that a contract must specify social insurance arrangements.

The strict employment protection articles in the LCL may incur "adaptive" incentives for both employers and employees, resulting in mixed or sometimes intended labor market outcomes. On the demand side, Chen and Funke (2009) construct a theoretical model for firms' behavior under the new law and calibrate their intertemporally optimal labor demand constrained by fixed and increasing costs of hiring and firing. Their

model predicts a larger "inaction" regime in which firms delay new appointments as well as layoffs. This yields ambiguous employment outcomes at the firm level as both recruitment and redundancy become more difficult. However, over a 10-year period, they predict that the aggregated employment in urban China will increase as long as the economic growth rate can be maintained or, at the firm level, labor productivity growth outpaces wage growth. Cooper *et al.* (2013) use Annual Surveys of Industrial Production (1998-2007) to simulate the consequences of the LCL. They find that increasing firing costs make a positive and robust impact on private firms' employment at the expense of low labor re-allocative efficiency. Nevertheless, the field work (including 320 workers in Shenzhen in May 2008) conducted by Wang *et al.* (2009) also reveals firms' adverse responses which circumvent the LCL. 22% of workers reported that their employers increased dormitory and canteen prices and fines for insubordination to offset minimum wage provision and increased costs of hiring. Some firms forced employees to terminate their contracts before the new law came into effect and rehired them thereafter and some labor-intensive manufacturers shifted to regions where wages were relatively low.

On the supply side, the consequences in sequential job search and match are still unclear. Job-match efficiency in urban China declined substantially from 1996 to 2008 (Liu, 2013). Despite varying degrees of enforcement across regions and adoption by employers, some empirical studies have revealed a positive relationship between the implementation of LCL and signing long and short term contracts. Migrant workers in the Pearl River Delta in Guangdong province witnessed 7% increases in the contract rate according to Becker and Elfstrom (2010) and 18% according to Li and Freeman (2014) (from 43% in 2007 to 61% in 2008). Another survey including 4,758 migrant workers in 3,120 industrial firms across 40 cities conducted by Zhejiang University points to an increase of 8.6% from 2007 to 2008. Signing a contract increased coverage of the five

principal types of social insurance and reduced wage arrears (Gao *et al.*, 2012; Li and Freeman, 2014). The China Urban Labor Survey (CULS) shows that 22.2% (20.5%) of migrant workers obtained employer-provided pensions (health insurance) and this proportion increased to 23.8% (21.8%) in 2010 (Gallagher *et al.*, 2013). Based on the 2008 wave of Rural-Urban Migration in China (RUMiC), Cheng *et al.* (2015) document many benefits along with signing a labor contract, such as higher wages, shorter working hours, and improved access to various employee benefits, in particular, three crucial social insurance schemes. Nevertheless, segregation in labor markets persists in urban China according to their results: more urban than migrant workers benefit from social insurance and contracts have greater subjective value to urban employees than to migrants. There is no clear correlation between having a contract and participating in social insurance, especially for migrants who may have difficulties in paying for pension and health insurance (Li, 2008). Compared with provision made in a formal contract, personal contributions are large and increasing.[3] In hard times, migrants have to rely on their own savings or the help of social networks in the city (Giles *et al.*, 2006) and on family support (Zhao, 2003) and land in rural hometowns (Wang *et al.*, 2013). Anomalies are intensified by inconsistency in enforcement of the LCL. The CULS suggests that a contract does not necessarily entitle employees to social insurance (Gallagher *et al.*, 2013). The case studies in Chan (2009) also show notable limitation in access to employee benefits in globalized or female-employee-intensive industries (Cui *et al.*, 2013).

[3] In 2008, the employee (employer) had to contribute 8% (20%), 2% (7%) and 1% (2%) of the city-average monthly salary to pension, medical insurance and unemployment insurance. The employer was also responsible for work-related injury insurance and maternity insurance equivalent to 0.6%-2% (depending on industries) and 1% of the city-average monthly salary. The city-average monthly salaries have increased quickly, implying increasing financial burden for both employees and employers. This discourages employees from buying insurance. The Enterprise Annuity Report published annually by the Ministry of Human Resources and Social Security since 2007 shows that the number of enterprises setting up annuities increased only by 3.4% in 2008 and 1.2% in 2009.

The present study contributes to the literature in the following three ways. First, it adds to the studies on the ambiguous wellbeing consequences of EPL by identifying dynamic causality between employment protection, past unemployment history and post-unemployment outcomes. Salvatori (2010) and Freeman (2010) provide recent cross-country examination by using the European Community Household Survey and empirical evidence in developing countries, respectively. It would be of considerable interest to see new evidence from developing countries undergoing extensive socio-economic transformations. Urban China, in a situation of rapid economic growth, quick recovery from financial crisis, inconsistency in law-implementation, heterogeneous employer responses and segregated domestic labor markets, offers an ideal environment to assess the varied impact of EPL on employees' wellbeing. It is also worth noting time-varying employment effects, as pointed out by Chen and Funke's (2009) theoretical model. There have been different outcomes in unemployment duration since the enactment of the law. Both employers and employees' behavior and the macroeconomic environment change over time, especially during the economic downturn covered by our sample period.[4] The role of the LCL in formalizing labor markets has also weakened over time given official report.[5] Nevertheless, the aforementioned empirical studies have described the situation by descriptive statistics or case studies, or estimated (static) average treatment effects separately on different labor outcomes. The dynamic and complex role of the LCL remains unclear.

Second, this paper further highlights heterogeneity in dynamic causality among various labor market outcomes. It distinguishes between the overall and compositional impact of the LCL on labor market transitions and outcomes – the differences (or

[4] For example, Knight and Li (2006) find a positive association between past unemployment duration and post-unemployment wages by using data from 2000.

[5] According to the National Migrant Workers Report published annually by the NBS since 2009, the national average contract rate for migrant workers has remained around 42% since the enactment of the LCL (2008-2013) with diminution of permanent contracts and insurance-coverage.

discrimination, if any) between urban local workers and rural-to-urban migrants, and between males and females.

Third, this study makes a methodological advance in accordance with a rich dataset. It exploits a panel dataset covering individual urban and migrant workers in 15 cities from coastal to western China with individual employment history as long as a decade (2000-2009) and as many as four job transitions. As suggested in Giles *et al.* (2012), household surveys with individual employment histories can better facilitate the estimation of employment effects. We anchor dynamic endogeneity during the individual's sequential job search and match to a non-parametric joint distribution. Based on this, we identify the unemployment duration-dependent causal impact of LCL by using a sharp regression discontinuity design embedded in joint duration and multi-equation mixed models including simultaneously the probability of getting employed (i.e., unemployment hazard) and three critical dimensions of post-unemployment job match quality, namely job security in terms of employment hazard rates, wage level and the likelihood of coverage by employer-provided social insurance schemes.

The remainder of this paper proceeds as follows. The next section describes the dataset and provides exploratory analysis. Section 4 spells out the model. Section 5 discusses results and finally, Section 6 concludes.

3. Data

3.1. Construction of dataset

We use the Longitudinal Survey on Rural-Urban Migration in China (RUMiC) in 2008 and 2009 administered by the Institute for the Study of Labor (IZA). The dataset consists of rural and urban household surveys and the rural-to-urban migrant survey. This paper pools the latter two as the full sample. The migrant survey covers 15 cities in 9 provinces,

including provincial capital cities, municipalities and other major migrant receiving cities. The urban household survey covers 19 cities covering those in the migrant survey and 4 additional ones.[6] Table 1 lists the definition of all variables in our empirical analysis.

[Table 1]

We select sample workers by the following 6 steps. First, frictional unemployment is excluded to help purge the true impact of the Law on employment transitions. As there is no clear time cut-off distinguishing frictional unemployment from other kinds of unemployment, we define a cut-off of two weeks (14 days) and drop individuals (less than 1%) whose unemployment intervals are shorter. Second, we drop those outside working age – younger than 16 years old for both males and females or older than 60 for males and 55 for females. Third, those who are self-employed are also dropped since the new LCL focuses on formal labor markets.[7] Fourth, we purge the influence of the dramatic institutional changes in urban labor markets moving from a socialist system to a contract-based one. Specifically, urban residents had been guaranteed jobs in the state or collective-owned sectors until the mid-1990s, the "iron rice bowl" period.[8] The government restructured the state sector from 1994 by privatizing non-profitable or small/medium sized SOEs in order to protect large ones, which shattered the "iron rice bowl" and led to massive redundancy[9] as well as some job creation and high rates of reallocation (Dong and Xu, 2009). Thus, we further excluded those who obtained (or lost) jobs before 2000 and remained employed (or unemployed) thereafter. Fifth, individuals unemployed for more than 36 months were excluded. We considered that this population might not

[6] See http://idsc.iza.org/?page=27&id=58 for detailed information on sampling (accessed 13 January 2016).
[7] Workers may switch between employee jobs and self-employment in the presence of the LCL. We drop self-employed individuals given two concerns. For one thing, urban local workers have long made their lives on employee jobs rather than self-employment. For another, the LCL mainly "tightens" employers' costs of hiring and "adaptive behavior" in hiring as reviewed in Sections 1-2. The present paper focuses on how reemployment and wellbeing of employees have been affected by the LCL, while switch between employment and self-employment is beyond our scope.
[8] See Cai *et al.* (2008) for a comprehensive review of the history of China's labor markets.
[9] Over the period 1995-2000, urban employment dropped by 28% and 52% in the state and collective sectors, respectively. Authors' calculation based on the China Statistical Yearbook 2001 published by the NBS.

endeavor to find jobs, or might have poor work ethics which were part of their unobserved heterogeneity, or simply reported they were available for work when they were not. As such, transition spells of this population may not just be a result of LCL. Excluding them helps mitigate the problems of unobserved heterogeneity and measurement errors. Sixth, for the urban dataset, those who remained in 2008 as well as 2009 were selected to track longer trajectories of individual transitions in labor markets. After accounting for the attrition rate of 5.7%, there were 1,954 urban local workers in each wave (Table 2). For the migrant dataset, we pooled two waves to include as many samples as possible given the high attrition rate (64%) in 2009 compared with 2008.[10] Note that attrition only affects whether the individual has transition records beyond 2008 (i.e., the number of workers having the maximum number of (i.e., 4) transitions) with little influence on consistency of estimates, as we have transformed the dataset into the shape of "individual-employment (or unemployment) transition-spell length (number of months)". The distribution of urban/ migrant and male/ female workers was balanced within city (Table 2). More than half the selected workers, both urban and migrant, worked in service industries (followed by manufacturing) and were manual laborers.

[Table 2]

We proceed to derive sample workers' employment history. For employed individuals at the time of interview, there was one question: "When did you start this job?" We used it to count the length of employment spell in months and inferred backwardly the time of transiting from unemployment into this employment spell. Another question was "How long did it take you to find this job?" This gave us the length of the immediately past unemployment spell and so helped infer the time of starting that unemployment spell.

[10] This attrition is likely to be exogenously affected by the financial crisis rather than endogenous selection of remaining migrants. Flow population in China has long been migrating to different cities or returning to hometowns. The survey team reports particular difficulties during the financial crisis in tracking them.

As such, the 2008 wave allows us to track at most 2 recent transitions for those who were employed at the time of interview. For unemployed individuals at the time of interview, the question "When did you leave your last job?" helped us identify the length of current unemployment spell in months and the time of the immediately past transition from employment to (current) unemployment. As such, the 2008 wave allows us to track at most 1 recent transition for those who were unemployed at the time of interview. By analogy, information of at most 2 transitions and the length of employment and unemployment can be extracted from the 2009 wave. Note that individuals had different starting time for their transition trajectories as the surveys are retrospective, and two ending dates.[11] Overall, such a data structure allows at most 2 transitions for those in just one wave and 4 transitions for those in both waves.[12]

3.2. Data description

Figure 1 describes macro economy in finally selected sample cities. They performed relatively well – only 5 out of 19 cities (26.3%) were worse off than the national average in terms of GDP per capita and there was considerable openness – exports were higher than the national average. Overall, the domestic economy appeared to relate positively to exports. Local labor market outcomes may be sensitive to the city-level (domestic) economic environment and to the fluctuations of the international markets (notably the financial crisis hitting China in the second half of 2008), especially for migrants many of whom worked in export and manufacturing enterprises (Meng *et al.*, 2010). This justifies our control of macroeconomic environment in regressions in Section 4.

[Figure 1]

[11] The dates are 15 June 2008 for those only in the 2008 wave and 15 June 2009 for those only in the 2009 wave or in both waves.

[12] The case of 4 transitions could be such individuals who were found employed in 2008 (for whom the previous two transitions can be identified), transited into unemployment sometime between 2008 and 2009 but were luckily re-employed in the 2009 wave.

For individual workers, Table 5 tabulates the number of their observed transitions in labor markets. Regardless of gender or of different types of work, the overwhelming majority (at least 83.47%) experienced one transition. About 11% of urban samples experienced two transitions, which is in sharp contrast to 1.32% for migrants. The group experiencing three transitions was not small – 5.94% urban and 4.02% migrant workers.

[Table 2]

We proceed to look at four labor market outcomes. Figures 2 and 3 depict separately the empirical hazard rates of unemployment and (subsequent) re-employment. The downward slopes indicate that the longer the unemployment (re-employment) duration, the lower the probability of finding (losing) a job, i.e., negative duration dependence in both unemployment and re-employment spells. Figure 2(a) suggests that the LCL makes harder for local urban workers to find jobs, but this effect is likely to be short-term and fades away after 6 months' unemployment. By contrast, Figure 2(b) indicates that the negative impact of the LCL on migrants' probabilities of re-employment is trivial for those out of work for one month, but the difference in hazard rates of unemployment before and after the implementation of the LCL increases after 6 months of unemployment duration. Figure 3 shows that neither urban nor migrant groups appeared to be influenced substantially by the LCL in their job seeking after longer unemployment.[13]

[Figures 2-3]

As introduced in Section 1, the central goal of the LCL was to formalize the labor market. Table 3 summarizes the contract status for sample individuals' primary jobs. In 2008, 83% of urban workers signed short-term, long-term or permanent contracts, as opposed to about 48% of migrants. More migrants obtained contracts in 2009 but this

[13] The Log-rank and Wilcox tests of equal survivor functions in Figures 2-3 are rejected at the 1% significance level except for migrants' unemployment-to-employment transition. This indicates statistically significant differences in job-finding rates and subsequent job security triggered by the LCL, despite possibly small magnitude of its impact.

proportion (72.57%) was still lower than their urban counterparts (83.12%). Among those with formal contracts, more workers had long-term contracts of over 1 year in both urban and migrant groups than those with permanent or short-term contracts for under a year. It is worth noting that the proportion of urban workers with permanent contracts decreased from 16.34% in 2008 to 15.93% in 2009, while this proportion for migrants in 2009 rose 2.5 times from 6.59% to 16.88% and there were broadly balanced increases for both male and female workers. It signals a generally favorable impact of the LCL on formalization of labor markets. Nevertheless, this improvement was uneven between urban and migrant workers and across cities. There were more contracted migrants between 2008 and 2009 in every city except Wuxi, as opposed to more contracted local urban workers only in Hefei and Bengbu (Anhui province) and no improvement at all in coastal (Guangzhou in Guangdong province and Hangzhou in Zhejiang province) and western regions (Mianyang in Sichuan province). The contract rate among urban workers even dropped in a few cities in both coastal and inland regions such as Ningbo (-9%), Luoyang (-16%), and Leshan (-12.5%).

[Table 3]

Uneven improvement between urban and migrant workers is also observed in wages. The average monthly wage was 1,997 *yuan* for urban workers in 2008, 21% higher than migrant workers' (1,655 *yuan*). The gap was more pronounced in 2009 than in 2008 – urban workers (2,306 *yuan*) earned 34% more than migrant workers did (1,716 *yuan*). Wages increased from 2008 to 2009 for urban workers except only three cities (Leshan and Anyang in Sichuan province and Bengbu in Anhui province), but migrant workers in 6 out of 15 cities (40%) suffered from wage reduction. The average annual growth rate of real wage was 15.1% for urban workers, which was in sharp contrast to 6.1% for migrants

with huge regional disparity – this positive average growth rate was driven mainly by a coastal province, Guangdong, and a central province, Henan.

At the same time, gender disparity emerged in wages. Figure 4 plots the sample women's median monthly wages against the men's by city. Women's wages were lower in both urban and migrant groups in every city during the sample period, except female migrants in Wuxi in 2009 because of that city's favorable policies for migrant workers.[14] Female urban workers in central and western areas were most disadvantaged – the median wage of those in Leyang in 2008 was only 30% of their male counterparts (Figure 4(a)). Coastal areas witnessed the greatest discrepancy for female migrants – the median wage of those in Hefei and Ningbo was 40% less than that of their male counterparts (Figure 4(b)). The average female (male) urban workers' median wage level was 9.3% (21.8%) higher than their migrant counterparts. Across different industries as in Figure 5, women were still worse off in most manufacturing and service industries in which the majority labor force participated, while women enjoyed higher wages than men in only a few high-skilled industries such as finance, education, health, technical services and the public sector.

[Figures 4 and 5]

Another important aim of the LCL was insurance-coverage in migrant workers' contracts. In fact, there was less improvement in social protection than in formalization. Table 4 tabulates four kinds of employer-provided social insurance, namely injury insurance, pension, unemployment insurance and housing funds. The coverage rate of a complete insurance package increased by only 2.93% for urban workers (from 29.61% to 32.54%), and decreased by 2.57% for migrants (6.79% to 4.22%). The former

[14] Such policies are a special regulation requiring employees to set up "wage payment reserves" in accounting to guarantee timely wage payment for migrant workers and fewer barriers to converting a rural household registration (*Hukou*) to an urban one. Those who have signed a labor contract and paid social insurance for at least two years can obtain a local urban *Hukou* for him/herself as well as children and spouse.

improvement was a result of higher coverage rates of all kinds of insurance. Given that the coverage rates of migrants' social insurance were higher in all kinds except housing, we suspected that the shrinking coverage of complete social insurance for migrants might be due to reduced housing assistance and/or employers' selection in providing social insurance for migrant workers. The gender break-down in Table 4 suggests that the improvement in coverage was greater for males than for females. Figure 6 shows that coverage of social insurance was unequal across cities, even within the same province. The coverage rates for urban workers in Guangdong province (Guangzhou and Dongguan) were high and increased but were low and decreased in the adjacent city, Shenzhen. In Sichuan province, a further 19.6 and 4.1% of urban workers in Leshan and Chengdu, received employer-provided social insurance in 2009 compared with 2008, while the coverage in Mianyang backslid by 0.6% (from 20.6% to 20%). The inequality in complete social insurance for migrants was more pronounced than among urban workers. As shown in Figure 6(b), Wuxi again suggests a "pro-migrant" environment: despite a 6% drop between 2008 and 2009, the coverage rate was extraordinarily high and even higher than the great majority of cities in Figure 6(a). In Guangdong province, Dongguan and Shenzhen experienced tiny increases in recipients of social insurance of 0.9% and 2.8%. In contrast, the coverage almost tripled in Chongqing and Chengdu in the western region.

[Table 4]

[Figure 6]

To sum up, our data suggest that the LCL may well affect not only the job-finding rates, depending on job seekers' past experiences in unemployment, but also subsequent welfare outcomes such as the hazard of losing the job, wages and probabilities of receiving social insurance. Further, there exists substantial heterogeneity in

implementation of the LCL and thus, different labor market outcomes between demographic groups as well as across cities.

4. Model

Motivated by the theories, the empirical model of this paper considers in a reduced-form specification the transition from unemployment to employment, jointly with three subsequent post-matching outcomes which are made dependent on not only the implementation of LCL but also individuals' past unemployment duration, namely employment hazard (job security), wages and provision of social insurance. Suppose the individual i has been unemployed until t_u and the transition takes place at the end of the time interval $(t_{u-1}, t_u]$, labelled as j_u, the probability of i exiting unemployment at duration d_u at time t_u, given that (s)he has stayed in unemployment spells up to t_u can be expressed as a standard discrete-time hazard:

$$h_u(t_u) = \Pr(T_{ui} = t_u \mid T_{ui} \geq t_u) \tag{1}$$

As Caliendo *et al.* (2013), we adopt empirically a log-logistic specification to represent the exit rate from unemployment to employment, $\lambda_u(t)$, in period t:

$$\lambda_{ui}(t) = \left(1 + \exp\left(-y_{ui}(t)\right)\right)^{-1} \tag{2}$$

where

$$\begin{aligned} y_{ui}(t) = {} & \alpha_u + \sum_{d=1}^{k} \beta_{1ud} f_{uid}(d_u) + \sum_{d=1}^{k} \delta_{ud} f_{uid}(d_u) D_i + \beta_{2u} X_{it} \\ & + \beta_{3u} D_i (Time_i - Time_0) + \beta_{4u} (1 - D_i)(Time_i - Time_0) + \beta_{5u} X_{ct} + \eta_{ui} \end{aligned} \tag{3}$$

In Eq. (3), α_u denotes a constant in this unemployment equation. $f_{uid}(d_u)$ represents the base line hazard which is a function of duration (d_u) that i has sunk into unemployment spells. In order to better accommodate non-linear duration dependence, the empirical

analysis applies non-parametric specification to $f_{uid}(d_u)$, i.e., a set of dummies reflecting an interval at which i is at risk of shifting out of unemployment spells. $\hat{\beta}_{1ud}$ with $d_u = [1,\ldots,k]$ captures true duration dependence of unemployment. X_{it} includes household-specific characteristics (e.g., age, gender, educational attainment, health status, dependency ratio, occupation and in which industry i was working. X_{ct} includes city-level covariates, including (time-variant) natural logarithmic GDP per capita and export per capita compatible with constructed individuals' transitions.[15] Inspired by calibrations of Chen and Funke's (2009) theoretical model, Chinese firms' hiring decision varies according to output market conditions over time. Inclusion of these micro and macro variables helps purges this demand-side effect and the influences of individuals' macroeconomic dynamics (particularly during the financial crisis, 2008-2009). η_{ui} denotes the time-invariant unobserved heterogeneity driving i's transition out of unemployment spells. D_i is the treatment indicator, taking the value of 1 if the unemployment took place after the implementation of the LCL and zero otherwise. In other words, the assignment of treatment and control groups depends on time: i belongs to the treatment (control) group if i's transition out of his/her current situation took place after (prior to) January 1st, 2008. The forcing variable should be strictly exogenous for valid identification of treatment effects. Figure 7 depicts the distribution of transition time from unemployment to employment for urban and migrant workers, respectively. No significant discontinuity is evident around the cut-off, which is the date the LCL was put in effect. More specifically, the McCrary's (2008) density test cannot firmly reject the null hypothesis of equal density distribution of transition time before and after January 1st, 2008 – the logarithm

[15] That is, we compile city-level variables into individual-month-transition/performance dataset constructed in Section 3 according to the time (month and year).

differences in height of the density estimates are 0.183 with the standard error being 0.092 for urban workers and 0.097 with the standard error being 0.149 for migrants.

[Figure 7]

This conforms to a sharp regression discontinuity, in the language of Caliendo *et al.* (2013), with the date of implementation of the LCL (and thus, the length of time between it and the labor transition) being the satisfactory forcing variable. The estimate of the interaction between the receipt of treatment and the baseline hazard, $\hat{\delta}_{ud}$, captures the causal impact of the LCL on unemployment hazard *conditional* on individuals' past unemployment duration. In order to improve identification, we also directly controlled for the forcing variable to accommodate any correlation between the transition rate and the time (in months) from the transition out of the current spell to the enforcement of the law (i.e., $Time_i - Time_0$ and $(1-D_i)(Time_i - Time_0)$ in Eq. 3). Therefore, $\hat{\beta}_{3u}$ and $\hat{\beta}_{4u}$ help purge the causal impact of the LCL ($\hat{\delta}_{ud}$) of *unconditional time trends* which may be driven by other unobserved factors affecting the whole labor markets. $\hat{\beta}_{4u}$ also picks up influences of individuals' expectations of the enforcement of the LCL on their labor market behavior for those transiting out of unemployment before the LCL. Unlike $\hat{\delta}_{ud}$, $\hat{\beta}_{3u}$ and $\hat{\beta}_{4u}$ can be understood as the impact of the LCL on the probability of exit from unemployment *unconditional* to *i*'s previous unemployment duration.

The worker *i* will not stop after exiting unemployment spells, but rather continue his/her "journey" in labor markets and bear the outcomes. As reviewed in Section 2, employers' as well as employees' own adaptive responses to the LCL may yield ambiguous effects for employees' wellbeing in this sequential job match process. The present section proceeds to modelling the aforementioned three outcomes following successful job matching.

First, by analogy to Eq. (3), *i*'s job stability in terms of transition from employment to unemployment can be written as:

$$\lambda_{ei}(t) = \left(1 + \exp\left(-y_{ei}(t)\right)\right)^{-1} \tag{4}$$

where

$$\begin{aligned} y_{ei}(t) = \alpha_e + \sum_{d=1}^{k} \beta_{1ed} f_{uid}(d_u) + \sum_{d=1}^{k} \delta_{ed} f_{uid}(d_u) D_i + \sum_{d=1}^{k} \beta_{2ed} f_{eid}(d_e) + \beta_{2e} X_{it} \\ + \beta_{3e} D_i \left(Time_i - Time_0\right) + \beta_{4e}\left(1 - D_i\right)\left(Time_i - Time_0\right) + \beta_{5e} X_{ct} + \eta_{ei} \end{aligned} \tag{5}$$

As in Eq. (3), $f_{uid}(d_u)$ and the associated estimator $\hat{\beta}_{1ed}$ measure true unemployment duration dependence. $\hat{\delta}_{ed}$ reflects the unemployment-duration-dependent causal impact of the LCL on subsequent job stability for those who left unemployment in the interval d_u.[16] Additionally, we control explicitly for employment duration ($f_{eid}(d_e)$) to improve identification and pick up true employment duration dependence.

Second, the wage equation is expressed as follows:

$$\begin{aligned} \ln w_t = \alpha_w + \sum_{d=1}^{k} \beta_{1wd} f_{uid}(d_u) + \sum_{d=1}^{k} \delta_{wd} f_{uid}(d_u) D_i + \beta_{2w} X_{it} \\ + \beta_{3w} D_i \left(Time_i - Time_0\right) + \beta_{4w}\left(1 - D_i\right)\left(Time_i - Time_0\right) + \beta_{5w} X_{ct} + \eta_{wi} \end{aligned} \tag{6}$$

where $\hat{\delta}_{wd}$ measures the causal impact of the LCL on post-unemployment wages depending on the length of previous unemployment duration. The previous unemployment duration is explicitly controlled for by $f_{uid}(d_u)$ with the estimator $\hat{\beta}_{1wd}$. To improve identification of Eq. (6) compared to previous transmissions (Eqs. 1-5), we further controlled for the employment length (logarithmic months) of the individual's current job

[16] One may be concerned with heteroskedasticity in errors as some households with multiple transitions between employment and unemployment were used more than once in the duration equations (Eqs. 2-5). Adopting Solon *et al.*'s (2015) suggestion, we detected this problem by the following two steps. First, we obtained the standard errors by estimation the models in Section 4. Second, the estimated standard error for each subject *i* in the models was regressed on $1/J_i$ where J_i denotes the within-group population, in other words, how many times *i* has been used in the unemployment duration model (Eqs. 2-3) and/or the employment duration model (Eqs. 4-5). The OLS estimation yields statistically insignificant estimator for $1/J_i$, which implies broadly homoscedastic standard errors. This is not surprising in our dataset as only 7% of the full sample was used more than once.

and the natural logarithmic monthly subsidies of accommodation and food provided by the employer in X_{it}.

Third, the individuals who successfully find a job are also likely to be covered by social insurance as emphasized by the LCL for the protection of employees. Let $s_i = 1$ denote having a complete social insurance package (including injury insurance, unemployment insurance, pension, and housing funds) and zero otherwise. The probability of obtaining social insurance is expressed by:

$$\Pr\left(s_i = 1\right) = \mathbf{1}\left(\begin{array}{l} \alpha_s + \sum_{d=1}^{k} \beta_{1sd} f_{uid}\left(d_u\right) + \sum_{d=1}^{k} \delta_{sd} f_{uid}\left(d_u\right) D_i + \beta_{2s} X_{it} \\ + \beta_{3s} D_i \left(Time_i - Time_0\right) + \beta_{4s}\left(1 - D_i\right)\left(Time_i - Time_0\right) + \beta_{5s} X_{ct} + \eta_{si} > 0 \end{array}\right) \quad (7)$$

where $\hat{\delta}_{sd}$ captures the causal impact of the LCL on new job quality in terms of employer-provided social insurance, which presumably hinges on the length of *i*'s previous unemployment duration at d_u. The previous unemployment duration $f_{uid}\left(d_u\right)$ is included explicitly to help disentangle the above unemployment duration-dependent causal impact. To enhance identification of Eq. (7) compared to previous equations (Eqs. 1-6), we further controlled for whether the individual has local urban household registration (*Hukou*) which is attached to various local social protection packages in X_{it} and the city-level coverage rate of employer-provided social insurance in X_{ct}.[17]

We assume that each unobserved heterogeneity – η_{ui}, η_{ei}, η_{wi} and η_{si} – follows a normal distribution in their own equations. The likelihood for each observation in the system is the product of the likelihood for four labor outcomes:

[17] Presumably these instruments in wage and insurance regressions correlate with their own outcome variables but are irrelevant to the other outcomes. Note that they are not necessarily strictly exogenous instrumental variables for each outcome equation as other unobservables underlying each outcome variable are also made correlated and jointly distributed. Here weak instruments are sufficient to help improve substantially the identification of the whole system (Roodman, 2011).

$$l_i(\eta_{ui},\eta_{ei},\eta_{wi},\eta_{si}) = \prod_{t=1}^{j_u-1}\left(1-\lambda_u(t\,|\,\eta_{ui})\right)\left(1-\lambda_u(j_u\,|\,\eta_{ui})\right)^{1-\tau_u}\lambda_u(j_u\,|\,\eta_{ui})^{\tau_u}$$
$$\prod_{t=T_{ui}+1}^{T_{ui}+j_e-1}\left(1-\lambda_e(t\,|\,\eta_{ei})\right)\left(1-\lambda_e(T_{ui}+j_e\,|\,\eta_{ei})\right)^{1-\tau_e}\lambda_e(T_{ui}+j_e\,|\,\eta_{ei})^{\tau_e} \quad (8)$$
$$\frac{1}{\sqrt{2\pi\sigma^2}}e^{\left(-\frac{(\ln w_i-\ln\hat{w}_i)^2}{2\sigma^2}\right)}\Phi(\bullet)^{s_i}\left(1-\Phi(\bullet)\right)^{1-s_i}$$

where the indicator τ_u (τ_e) takes the value of one if *i* transits from unemployment (employment) to employment (unemployment) and zero otherwise; $\Phi(\bullet)$ denotes the cumulative normal distribution function derived from Eq. (7).

We further address *dynamic* endogeneity by assuming that above four kinds of unobservables embedded in the same worker *i* follow an unspecified joint and discrete distribution supported by mass points rather than an independent normal distribution for each unobservable. As such, individual's transition to employment status and the following wellbeing outcomes in labor markets may be driven jointly by his/her unobserved ability and/or intrinsic characteristics across the above four sequential labor market outcomes (i.e., individual's coherent traits underlying his/her sequentially coordinated decisions and performance in labor markets).

In line with Heckman and Singer (1984), we estimate Eqs. (2)-(7) jointly and non-parametrically. Let individuals be separated into $m \in \{1,\ldots,M\}$ groups based on unobserved traits that underlie their different hazards of transition between employment and unemployment, and the associated subsequent wage levels and probabilities of participating in social insurance schemes. For each type of traits m, the individual *i* falling into this type is endowed with the unobservables, $(\eta_{um},\eta_{em},\eta_{wm},\eta_{sm})$, leading to his/her observed four labor outcomes. Each unobserved factor is time-invariant and individual-specific for each outcome. For the same person *i*, the four unobservables in four outcomes are correlated and jointly distributed, but do not necessarily have the same magnitude.

More importantly, the unobservables do not correlate with observed characteristics or treatment under the RDD set-up. The probability of having a particular combination of four unobserved traits underlying his/her four labor states is defined by $\Pr\left(\eta_{ui}=\eta_{um},\eta_{ei}=\eta_{em},\eta_{wi}=\eta_{wm},\eta_{si}=\eta_{sm}\right)=\pi_m$. Therefore, the individual i's likelihood function becomes l_{im} if i is endowed with $\left(\eta_{um},\eta_{em},\eta_{wm},\eta_{sm}\right)$ at the probability of π_m. The sample likelihood function is written as:

$$L=\prod_{i=1}^{N}\sum_{m=1}^{M}\pi_m l_{im} \tag{9}$$

Empirically, we begin by estimating Eqs. (2)-(7) under the joint normal distribution of four kinds of unobserved heterogeneity, i.e., the benchmark regression.[18] Then, we use the estimation results of the benchmark regression as initial values and evaluate the likelihood function Eq. (9) with two mass points determined by the Newton-Raphson method. One more mass point (k) is added if the value of Akaike information criterion (AIC) decreases. The search procedure for mass points stops when the AIC ceases to decline.

We estimate separately the above model for (1) urban and migrant workers, and (2) male and female workers.[19] In other words, the identification (Eqs. 3 and 5) relies on temporal variation before and after the implementation of the LCL within each type of workers, rather than the (second) differences in labor market (sequential) outcomes between urban and migrant workers or between male or female workers. The inter-group differences will be discussed by comparing the group-specific estimation results. The

[18] The initial values of parameters used to evaluate the likelihood function Eq. (8) are selected randomly within [-100, 100]. For each initial value, we iterate 100 times to make sure of convergence and obtain the ML estimators. To minimize the local maximum problem, we also set randomly 1,000 initial values for each of the four equations representing four labor market outcomes separately and obtain the estimators after comparing $\ln\ell$ across them. Then, we re-set initial values around those estimators and obtain the final results of the benchmark regression. That those results are similar to those obtained before indicates that the ML estimators are valid and can be used with confidence.

[19] An ideal divide would be looking at different genders within urban and migrant workers, i.e., 4 subgroups. However, estimates become significantly inefficient given limited sample sizes in this divide.

considerations driving this strategy are that (i) workers in different subgroups search in the same labor market, (ii) firms may not be able to direct completely their search toward a particular group of workers, (iii) other observed factors in the model might affect different subgroups in different ways and adequately capture macroeconomic changes between 2008 and 2009.[20]

5. Estimation results

5.1. Duration-dependent impact on unemployment

We first detect the overall duration dependence by estimating Eqs. 3 and 5 with a fully parametric specification ($f_{uid}\left(d_u\right)=\ln d_u$ and $f_{eid}\left(d_e\right)=\ln d_e$) and the treatment indicator D_i without other covariates. As shown in the upper panel of Table 6, negative unemployment duration appears, consistent with our data structure in Figure 2. The law itself also affects labor markets: it delays reemployment for urban and male workers and threaten the security of the new jobs for all subgroups.

[Table 6]

We then implement the search procedure and non-parametric specification in Section 4 and identify 5 mass points. The fully non-parametric specification of unemployment duration yields negative duration dependence in the first month of unemployment for all four groups: the estimated coefficients of one-month unemployment ($\hat{\beta}_{1ud}$ in Eq. 3) are -6.556, -23.558, -6.223 and -6.193 for urban workers, migrants, males and females at 5% significance levels.[21] They can be translated into average marginal effects of one-month unemployment on reemployment probabilities by the following equation:

[20] For instance, migrant workers suffered from the 2008-09 recession more than urban workers did.
[21] Full estimation results of unemployment duration dummies are available from the authors upon request.

$$\frac{\partial \lambda_{ui}(t)}{\partial f_{uid}(d_u)} = \frac{1}{N}\sum_{i=1}^{N}\left[\left(1+\exp\left(-y_{ui}(t)|_{f_{uid}(d_u)=1}\right)\right)^{-1} - \left(1+\exp\left(-y_{ui}(t)|_{f_{uid}(d_u)=0}\right)\right)^{-1}\right] \quad (10)$$

That is, -20, -36.4, -40.6 and -36.1 percentage points for four subgroups separately. There is substantial individual heterogeneity: the strongest negative unemployment dependence (-99.2%) appeared among migrant workers.

This echoes the negative unemployment duration dependence in Figure 2 as well as the shape of duration dependence – the first (quickly) downward-sloping and then flat unemployment hazard rates at longer unemployment duration. Further, short-term negative duration dependence has driven the overall negative estimators of unemployment duration in the upper panel of Table 6. This also means that the fully parametric approximation of past unemployment duration exaggerates negative unemployment duration dependence in the long-term by over-simplifying the situation and this justifies our flexible and non-parametric model specifications.

Different from Table 6, the LCL exhibits compositional effects across subgroups as well as different past unemployment spells. Tables 7-8 report the duration-dependent impact of the LCL on unemployment transitions, i.e., $\hat{\delta}_{ud}$, $\hat{\delta}_{ed}$, $\hat{\delta}_{wd}$ and $\hat{\delta}_{sd}$ in Eqs. (3), (5), (6) and (7) separately. We first look at unemployment-duration-dependent job-finding probabilities in the presence of LCL ($\hat{\delta}_{ud}$). As aforementioned, the degrees of one-month unemployment duration dependence ($\hat{\beta}_{lud}$) were much stronger for migrants (-23.558) than for urban workers (-6.556). The LCL further lowered migrants' job-finding rates after a month's unemployment more than it did for their urban counterparts as indicated by the negative $\hat{\delta}_{ud}$ (i.e., -7.583 in Column 5 as opposed to -3.286 in Column 1 of Table 7). Such downward shift of short-term negative unemployment duration is stronger for males compared to females (-10.096 in Column 1 as opposed to -4.925 in Column 5 of Table 8).

Again, we can translate conditional impact of the LCL on job-finding probabilities at the end of the first month's unemployment into average marginal effects by:

$$\frac{\partial \lambda_{ui}(t)}{\partial f_{uid}(d_u)} = \frac{1}{N}\sum_{i=1}^{N}\left[\left(1+\exp\left(-y_{ui}(t)|_{f_{uid}(d_u)=1, D_i=1}\right)\right)^{-1} - \left(1+\exp\left(-y_{ui}(t)|_{f_{uid}(d_u)=1, D_i=0}\right)\right)^{-1}\right] \quad (11)$$

The LCL on average strengthens the negative unemployment state dependence by 4, 32, 31 and 4.8 percentage points for urban locals, migrants, males and females separately in their first month's unemployment. The largest reduction of 41.2 percentage points in job-finding probabilities was again observed among migrants and a quarter of migrants suffered from at least a 20-percentage-point decrease under the LCL.

The negative impact of the LCL on reemployment dissipates quickly after one month of unemployment in all subgroups. Neither estimating the model without macroeconomic controls (GDP and exports) nor controlling the city-level unemployment rate as an additional regressor changes the above results, excluding the suspicion that the bargaining power induced by the pool size of the unemployed influences job-finding rates.

[Tables 7 and 8]

Overall, the LCL strengthens negative unemployment duration without contaminating significantly job seekers' searching intensity. The downward-shifting effect of the LCL on "true" negative unemployment-state dependence is likely to be realized by strengthening firms' sorting towards certain (high-skill or low-cost) types of workers – urban locals and females – under stricter EPL, rather than skill depreciation given the short-lived true negative duration dependence and the treatment effect (significant within one month of unemployment).[22] We will discuss further the reasons driving the urban-

[22] It seems counterintuitive that females are preferred to males in the context of developing economies. In effect, there is no significant difference between their education – average 9.9 years for sample males and 9.77 years for sample females. The results here are better understood with the estimates in Column 7 of Table 8. Given similar educational levels, we suspected that the unemployed females might be preferred because they were less likely to bargain for higher re-employment wages than males under the LCL.

migrant and gender differences in job-match probabilities with post-match quality in Section 5.2.

5.2. Post-unemployment outcomes in labor markets

We first look at job security. Employment *per se* shows negative state duration dependence (i.e., negative $\hat{\beta}_{2ed}$ in Eq. 5) in the first 2 months of employment for local urban workers and females and 5 months for migrants which is driven by males.[23] In other words, the longer the individual stays in the current job, the less likely he/she will leave. Past unemployment spells threatens job security (i.e., negative $\hat{\beta}_{1ed}$ in Eq. 5) only for urban locals. Conditional on the worker's past unemployment spells, the LCL helps stable employment for all subgroups within their first two months' unemployment (i.e., negative $\hat{\delta}_{ed}$ in Eq. 5 indicated by the first two estimates in Columns 2 and 6 of Tables 7 and 8). The magnitude of $\hat{\delta}_{ed}$ is larger if the worker was re-employed in the first month of unemployment than that if the transition to employment took place after two months' unemployment, but $\hat{\delta}_{ed}$ becomes insignificant if the worker's unemployment spell lasted over two months. This implies that the LCL protects job security for "high type" workers signaled by their short unemployment spell length in the past.

Second, conditional on workers' past unemployment duration, the wage effects of LCL ($\hat{\delta}_{wd}$ in Eq. 6) differ across subgroups. It is positive (negative) for urban (migrant) workers within two months' unemployment (Column 3 (7) of Table 7), meaning that the LCL increases urban locals' reemployment wages but decreases migrants'. It is also worth

[23] Full estimation results of employment duration dummies are available from the authors upon request. The positive employment duration dependence is consistent with the overall downward slope in Figure 3. Fully parametric specification in the lower panel of Table 6, however, misleads the conclusion as it is dominated by positive state dependence at the longer duration – positive employment duration dependence only emerges from the 8th and 10th months of employment for urban and migrant workers, respectively.

noting both positive $\hat{\delta}_{wd}$ and $\hat{\delta}_{ed}$ (i.e., 4.443 and 2.606 in Columns 2 and 3 of Table 7) after 5 months' unemployment for urban locals indicate that urban job seekers would even trade off job security for higher wages.

These urban-migrant differences are likely to be driven by their differentiated incentives: urban local workers consider high income and professional development as top priorities when choosing a job (Nielson and Smyth, 2008), while migrants are not only motivated by money-making aspirations, but also non-economic incentives such as helping (extended) family members, better educational opportunities for children (Song *et al.*, 2009) and personal development in terms of pursuit of modernity, city life, cosmopolitanism and new knowledge especially among female migrants (Chiang *et al.*, 2013). Thus, migrants may not deem reemployment wages as their top priority but rather a secure urban life: as shown by positive estimates in Column 8 of Table 7, the LCL increases migrants' likelihood of receiving insurances from employers (which were previously exclusive for urban locals) even at longer unemployment duration. Moreover, the wage-reducing effect of LCL could be predicted as the law binds most on migrants and mandated benefits have become enforced.[24]

Columns 3 and 7 of Table 8 further unveil wide gender disparity in post-unemployment wages. Male workers tend to maintain their reemployment wages in the presence of LCL if they found jobs within the first two months of unemployment and even for jobs found around the 21st interval (about the 36th month) of unemployment, while females' wages did not respond to the LCL. One reason may be gender-differentiated motivations in labor markets as aforementioned in Chiang *et al.* (2013): male workers are more likely to have economic motivations, while female workers suggest altruistic motivations for family members and children. Our finding also implies that male privilege

[24] A firm's costs of hiring a migrant worker under the LCL would rise by 20% even if it pays minimum social insurance fees, leading to 4.6% of increases in labor costs for an average firm (Li and Freeman, 2014).

in wages illustrated in Figures 4 and 5 in Section 3.2 persists or even becomes wider under the LCL.[25] Overall, the LCL is likely to widen re-employment wage inequality between urban and migrant, and between male and female workers.

Third, recipient of social insurances under LCL differs mainly between urban and migrant workers rather than gender, lending support to our previous discussion on differentiated wage effects. Migrants are more likely to receive a complete package including four kinds of employer-provided social insurance within the first half year of unemployment under the LCL (Column 8 of Table 7). By contrast, the coverage of social insurance for urban workers with LCL reacted sluggishly to the LCL, and even decreased for those finding new jobs at the 10^{th} and 13^{th} month of unemployment (Column 4 of Table 7). As aforementioned, this may be driven by different motivations between migrants and urban locals. The former think high of non-economic motivations in labor markets: they feel that social protection was worth a longer job seeking process and can trade off wages (as indicated by negative estimates in Column 7 of Table 7). Urban workers may alternatively trade off employer-provided social insurance (some of which they may have obtained because of their urban household registration) for higher pay (as indicated by positive estimates in Column 3 of Table 7) if they have been through the trauma of losing jobs. Another implication could be drawn from the labor demand side:

[25] The negative impact of wage for migrants seems to temper the positive result in Cheng *et al.* (2015) based on the RUMiC. Our findings would be better understood with the following differences in mind. First, the above studies examined the impact of having a formal labor contract because of implementation of the LCL on labor market outcomes, while we identify the impact of the LCL *per se* rather than its "second order" impact brought by obtaining labor contracts. In the presence of varied enforcement of the LCL across provinces and employees, a substantial number of migrants – albeit to a less extent – did not sign contracts even when the LCL came in force (as reviewed in Section 2 and shown in Table 3). Our result is predictable if the non-contracted workers' wages are supressed under the LCL. Second, the previous studies assessed an average treatment effect of the LCL, while our model picks up heterogeneity by making this treatment effect dependent on the worker's past unemployment history.

such long unemployment duration may signal workers' low capabilities and thus, employers may be reluctant to provide complete social insurance packages.[26]

5.3. Other covariates

Tables 9 and 10 report other control variables and the interaction between some of them and the treatment indicator, in order to test by which channels the LCL affects labor markets for whom.

[Tables 9 and 10]

The estimates of age, education and their interactions with the treatment in Tables 9 and 10 indicate that employers tended to hire elderly urban or male workers and the low-educated urban and migrant workers regardless of their gender because they accept lower reemployment wages and less likely to leave jobs under the LCL, especially for migrants.

Sorting of workers is also conditional on occupation and industry. Reemployment wages only increase for urban and male workers holding management positions in manufacturing sectors. Migrants' better social insurance coverage is only realized among professionals (Column 7 of Table 9). Despite of lowered employment hazard for migrants under the LCL as previously discussed in Table 7, they suffer from more volatile reemployment with lower pay if working in manufacturing and services sectors (Columns 5-6 of Table 9), especially males (Column 2 of Table 10).

It seems counterintuitive that better macroeconomic environment such as high GDP and export of the city tends to impair job security for migrants and males under the enforcement of LCL, as indicated by their positive interactions with the treatment (Column 5 of Table 9 and Column 2 of Table 10). It is worth noting that during economic prosperities, recruitment may become relatively easy and redundancy may not seem costly

[26] Unfortunately, we are unable to distinguish between the two due to limited employers' information in the dataset.

as that in economic downturns to firms. Thus, as adaptive behavior to strict employment protection legislation, employers adopt stringent tenure selection for a large number of "low-type" workers such as migrants rather than urban locals. As such, the LCL would hamper migrants' employment stability in the long-term.

Last, we examine the *unconditional* impact of the LCL and possible behavioral adaptation to the passage of the law before January 1st, 2008 (i.e., the estimates of $Time_i - Time_0$ and $(1-D_i)(Time_i - Time_0)$). The longer the time elapsed from the passage of the LCL, the higher the urban workers' employment hazard. Together with the statistically significant estimates of the time prior to the passage of the LCL on employment hazard, wages and insurance coverage, these findings cast doubt on the unconditional long-term protective function of the LCL.

6. Conclusion

This paper proposes a model system embedding a sharp RDD in individuals' transitions in labor markets and post-unemployment job match qualities. This allows us to address dynamic endogeneity underlying individuals' sequential choices and the associated welfare outcomes of job matching. Therefore, we can identify the dynamic causal impacts of the LCL depending on individuals' past unemployment histories and, at the same time, their subsequent job security and other aspects of wellbeing.

The LCL tends to intensify the distortion of hiring. Conditional on workers' past unemployment spell, the LCL even shifts downwardly the negative unemployment state dependence in the first month of unemployment though long-term employment remains unaffected. This negative effect varies with gender and types of workers – it took migrants and male workers longer to find new jobs than urban locals and females because the former two groups are more inclined to bargain for high wages, while the latter two care

more non-economic motivations. Consequently, in the post-unemployment outcomes, job security is better for migrants and females (at the expense of lower reemployment wages and better social insurance coverage) than for urban workers or males. As such, the LCL is likely to exacerbate wage inequality between migrant and urban workers and between genders.

Substantial heterogeneity also exists across occupations and industries. Migrants, who worked most in more open sectors such as manufacturing and services industries, suffer from more volatile jobs. During economic prosperities, the LCL makes the new jobs insecure for migrant and male workers by incurring adaptively employers' strict tenure selection.

Overall, the LCL seems to have realized its goals in protecting employees by enhancing job security, increasing wages and improving coverage of employer-provided social insurance in at least the short-term without "locking in" current employment or incurring long-term structural unemployment. Nevertheless, it should be noted that all these benefits are distributed very unevenly between urban and migrant workers and between males and females because of both employees' motivations and employers' adaptive sorting under the law.

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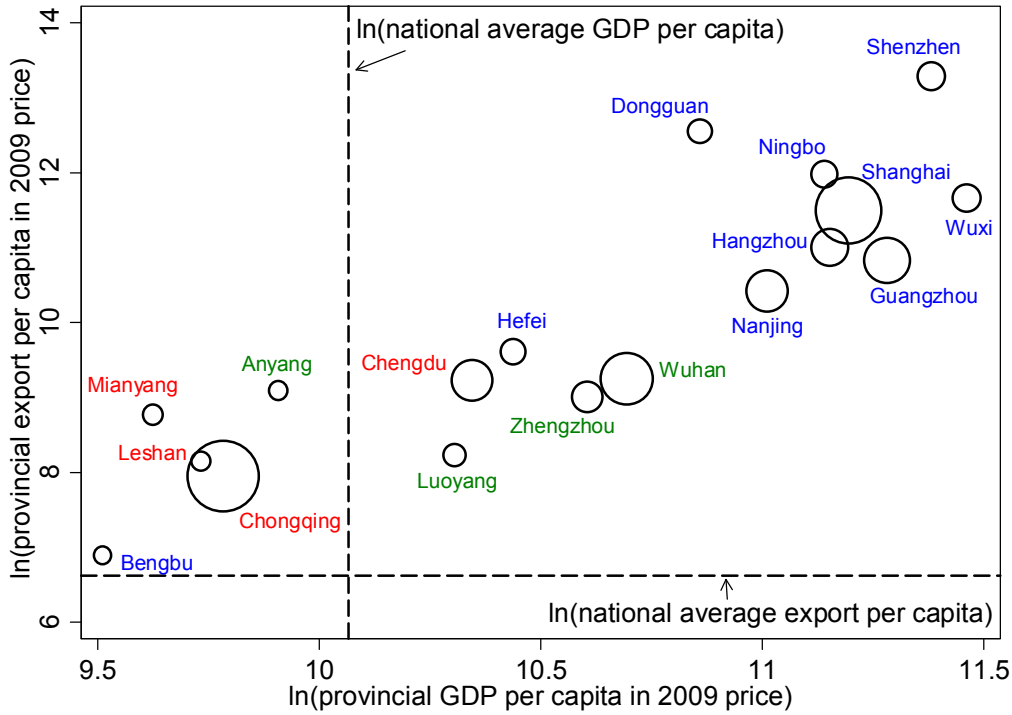
Figure 1 Economic condition in sample cities in 2008



Note: The size of the bubble represents the city population. The coastal, central and western regions are marked by blue, green and red.

Figure 2 Kaplan-Meier estimates of unemployment hazard rates
(a) Urban

(b) Migrant

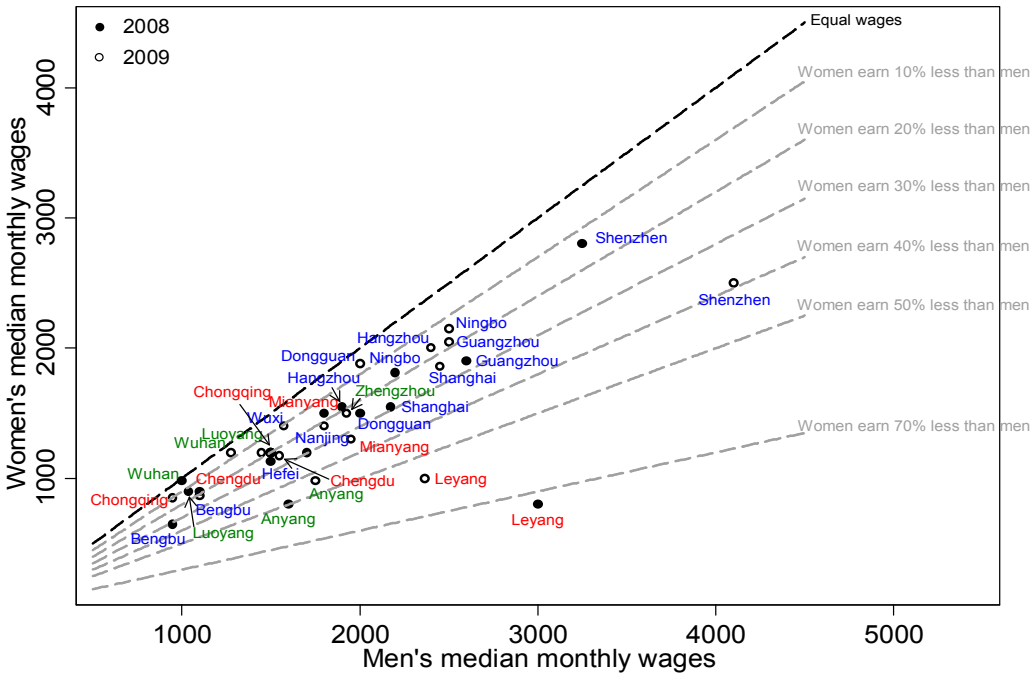
Figure 3 Kaplan-Meier estimates of employment hazard rates

(a) Urban

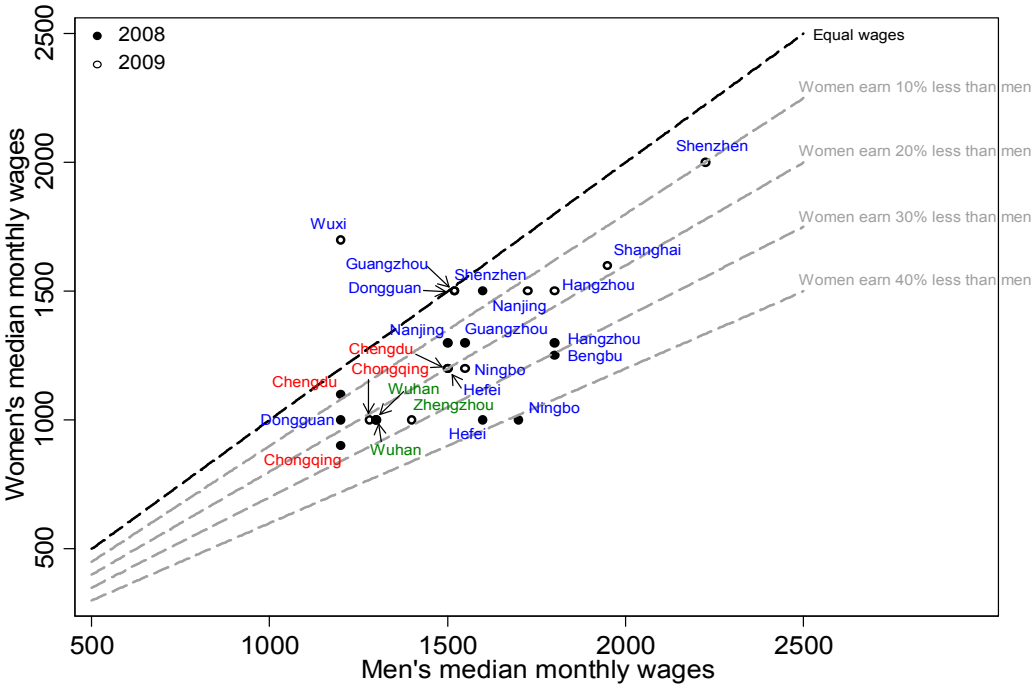
(b) Migrant

Figure 4 Gender differences in wages, by city

(a) Urban

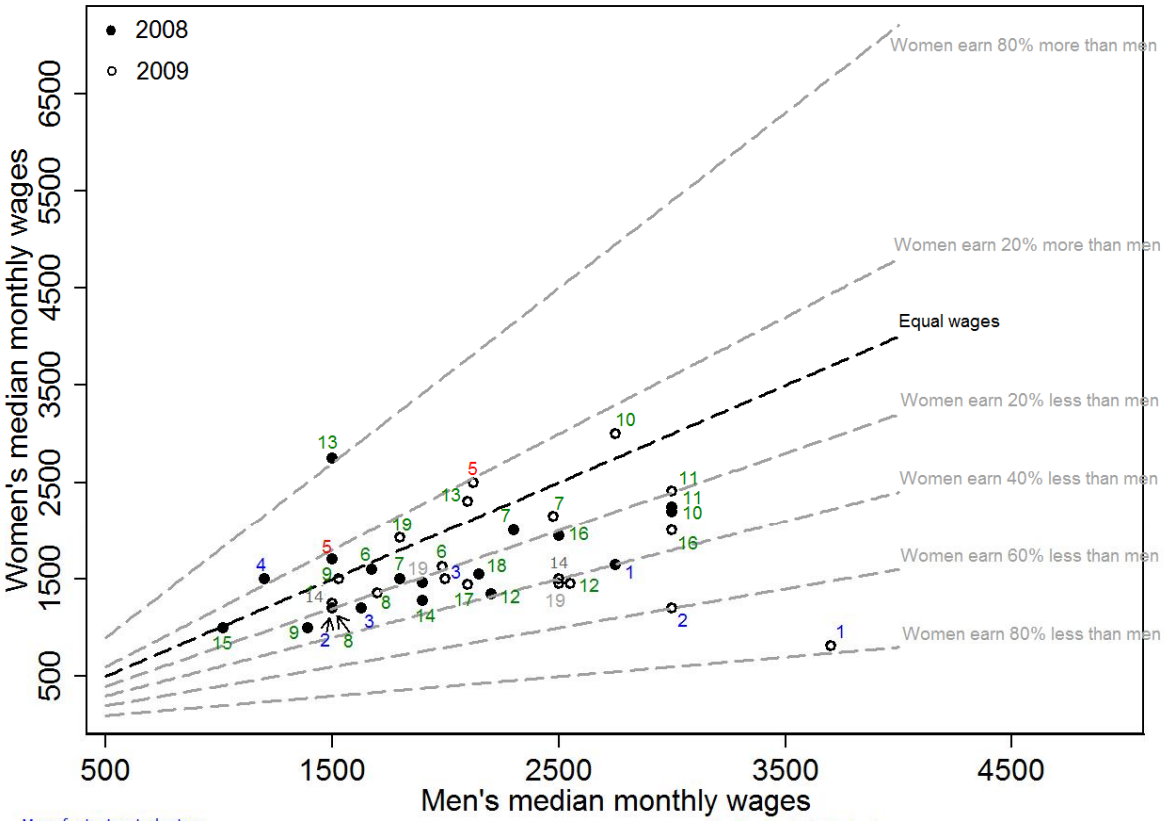


(b) Migrant



Note: All wages are in 2009 prices. The coastal, central and western regions are marked by blue, green and red colors.

Figure 5 Gender differences in wages, by industry
(a) Urban



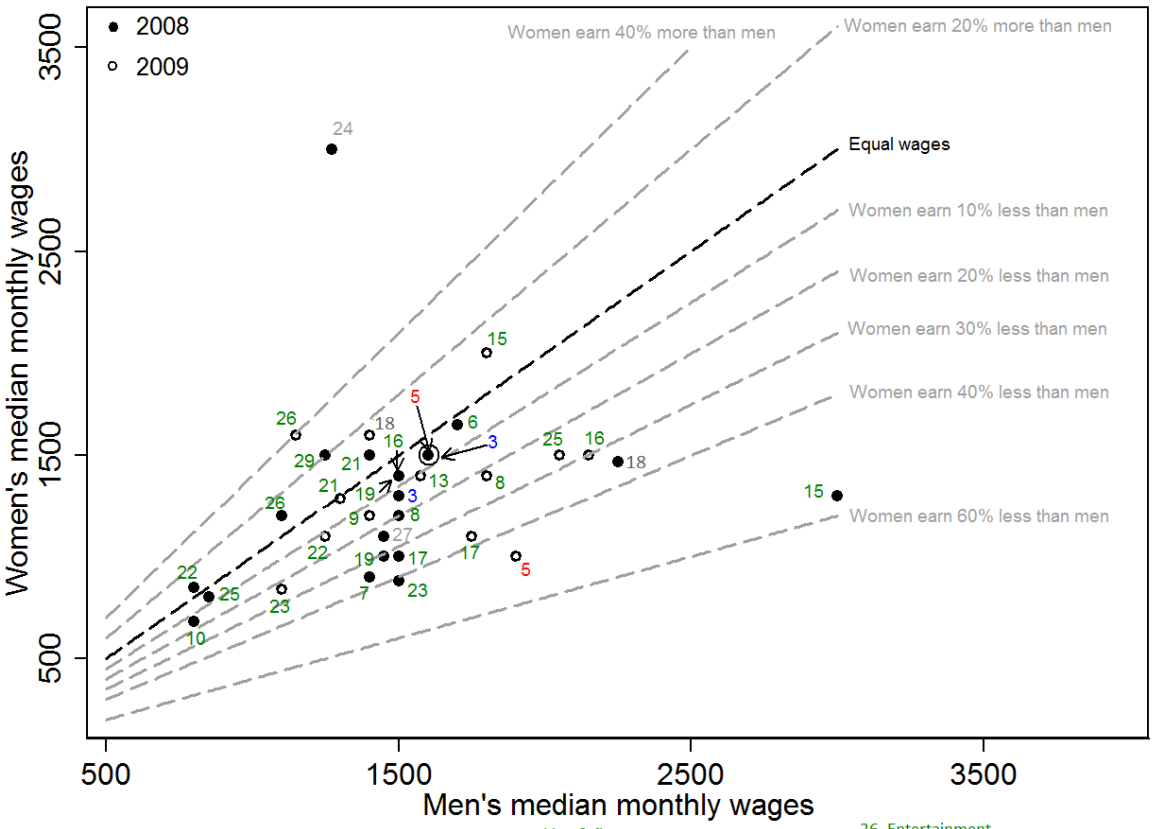
Manufacturing industry:
1. Agriculture, forestry & animal husbandry
2. Mining
3. Manufacturing
4. Production & supply of electricity, gas & water

Construction industry:
5. Construction enterprise

Service industry:
6. Transport, logistics & postal service
7. Information transformation, computer services & software
8. Wholesale & retails
9. Hotel & catering services
10. Banking & finance
11. Real estate industry
12. Leasing & business services
13. Scientific research, technical services
15. Services for households
16. Education
17. Health
18. Culture, sport & entertainment

Government and public sector:
14. Water conservancy, management of environment & public facilities
19. Public management & social organisation

(b) Migrant



Manufacturing industry:
3. Manufacturing

Construction industry:
5. Construction enterprise

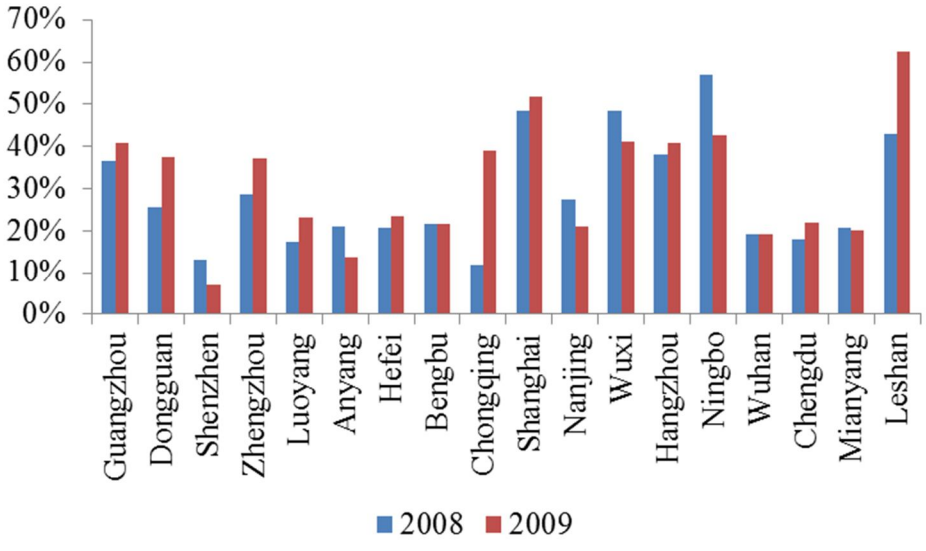
Service industry:
6. Transport, logistics, postal service
7. Information transmission, computer services & software
8. Wholesale & retails
9. Hote & catering services
10. Banking & finance
13. Real estate industry
15. Leasing & business services - accountant
16. Leasing & business services - others
17. Scientific research, technical services
19. Social services - agency
21. Social services - others
22. Education
23. Health
25. Journalism & publishing
26. Entertainment
29. Services for households

Government and public sector:
18. Management of water conservancy, environment & public facilities
24. Social security & social welfare
27. Public management & social organisation

Note: All wages are in 2009 prices.

Figure 6 Coverage of complete social insurance in total employment

(a) Urban



(b) Migrant

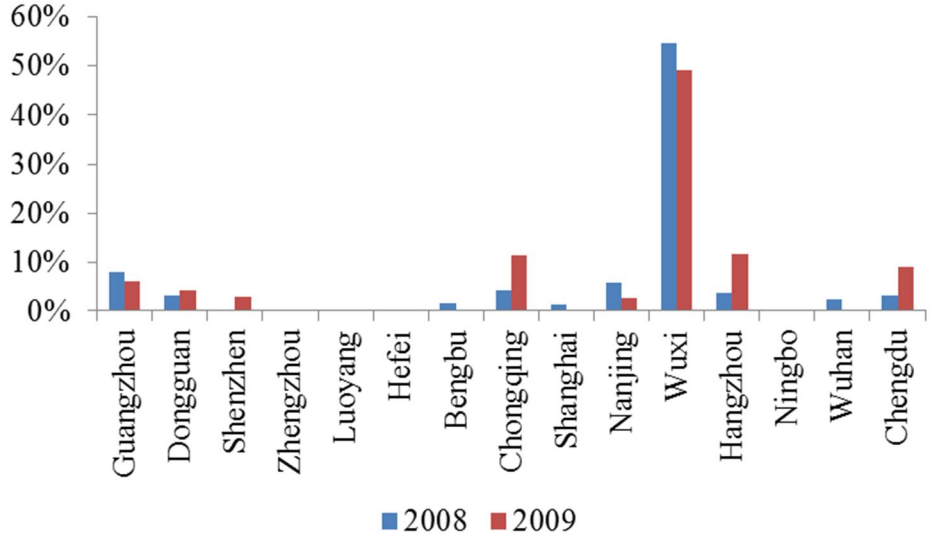
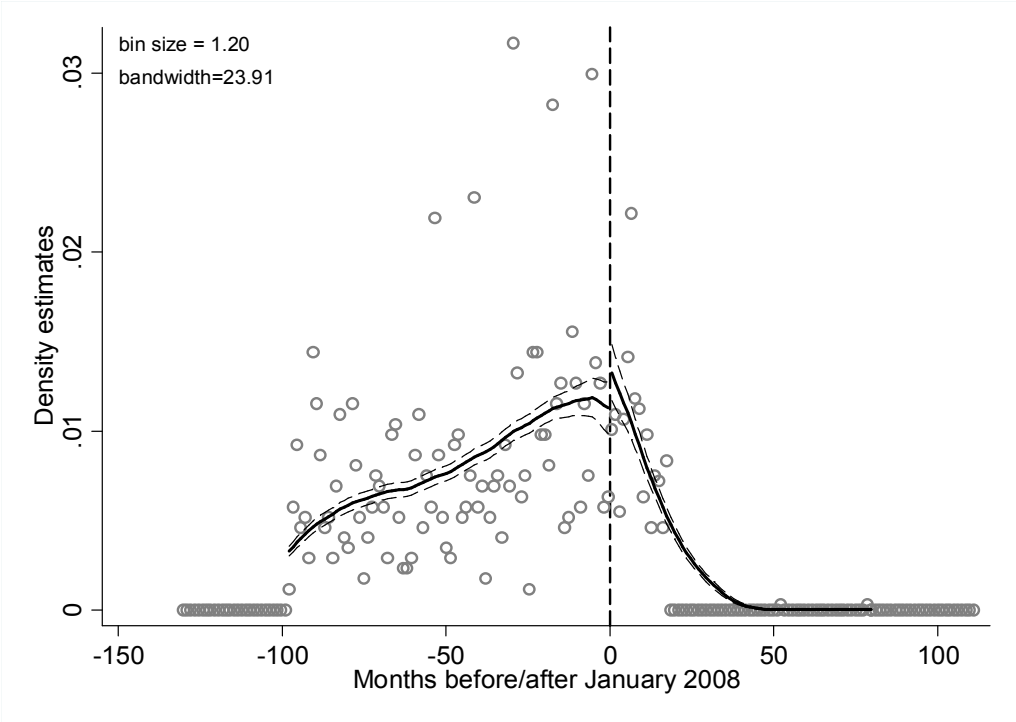
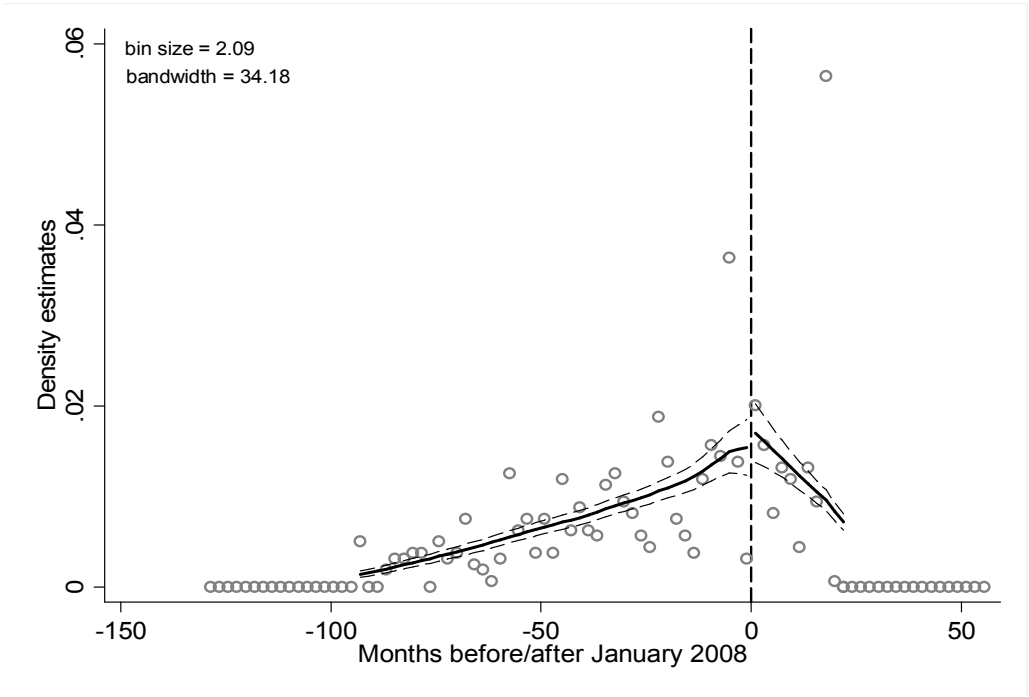


Figure 7 Distribution of transition time from unemployment to employment

(a) Urban



(b) Migrant



Note: The circle represents the average of transition time measured as months to/after January 2008 in each bin. The optimal bin size and bandwidth are selected by McCrary's (2008) procedure. The solid line is the smoothed bin midpoints by local linear smoothing regressions, the dash lines below and above which frame the 10% confidence intervals.

Table 1 Definition and descriptive statistics[a]

Variable	Definition	Urban		Migrant	
		Mean	S.D.	Mean	S.D.
Treatment					
Treatment	Dummy variable taking the value of 1 if the worker has unemployment-to-employment transition after January 1st, 2008.[b]	0.353	0.478	0.244	0.430
Wage					
Ln(wage)	Logarithmic monthly wage (*yuan* in 2009 prices).	5.425	3.348	4.806	3.477
Social insurance					
Social insurance	Dummy variable taking the value of 1 if the worker obtained a full package of employee benefits including 4 social insurances (unemployment, pension, injury and housing); 0 otherwise.	0.359	0.480	0.186	0.390
Demographics					
Gender	Dummy variable taking the value of 1 if the worker is male and 0 for females.	0.479	0.500	0.559	0.497
Age	The worker's age measured in years.	36.890	10.999	30.114	9.110
Edu.	The worker's education level in years.	10.890	1.714	8.979	2.410
Dependency ratio	The number of children (under 18 years old) raised by the worker.	0.412	0.426	0.439	0.433
Occupation					
Professional	Dummy variable taking the value of 1 if the worker is a professional; 0 otherwise.	0.169	0.360	0.006	0.063
Management	Dummy variable taking the value of 1 if the worker is a manager; 0 otherwise.	0.035	0.178	0.038	0.105
Manual	Dummy variable taking the value of 1 if the worker is a manual labor, including clerks, service staff in various industries, agricultural workers, and manufacturing and transporting related staff; 0 otherwise.	0.548	0.500	0.553	0.500
Industry					
Construction	Dummy variable taking the value of 1 if the worker is in construction firms; 0 otherwise.	0.027	0.165	0.045	0.215
Manufacturing	Dummy variable taking the value of 1 if the worker is in manufacturing firms, including agriculture, mining, manufacturing, and production and supply of electricity, gas and water; 0 otherwise.	0.134	0.341	0.163	0.376
Services	Dummy variable taking the value of 1 if the worker is in the services industry, including transport, storage, post, information transmission, wholesales and retails, hotel and catering, finance and banking, insurance, security services, real estate, law, other business services, scientific research, agencies, tourism, education, health, journalism and publication, entertainment, services to households; 0 otherwise.	0.507	0.499	0.459	0.500
Government	Dummy variable taking the value of 1 if the worker is in the government or other (semi-)public sectors, including social security and social welfare, public management and social organizations, international organizations, and management of water conservancy, environment and public facilities; 0 otherwise.	0.062	0.242	0.002	0.049
City-level economic conditions[c]					

Ln(city GDP per capita)	Logarithmic city-level GDP per capita (*yuan* in 2009 prices).	10.623	0.632	10.623	0.632
Ln(city export per capita)	Logarithmic city-level export (*yuan* in 2009 prices).	9.805	1.787	9.805	1.787
Direct time control					
Time before Jan. 2008	The number of months between the time of unemployment-to-employment transition and January 2008 for the transition taking place before the implementation of the LCL.	52.229	54.616	35.445	30.496
Time after Jan. 2008	The number of months between the time of unemployment-to-employment transition and January 2008 for the transition taking place after the implementation of the LCL.	8.231	4.757	11.307	6.453
Additional instruments					
Employment length	The number of months in continuous employment.	52.704	30.998	39.904	28.650
Ln(monthly subsidies)	Logarithmic monthly subsidies provided by the employer (*yuan* in 2009 prices).	1.254	2.231	1.848	2.686
Health	Dummy variable taking the value of 1 if the worker was sick or injured in the last 3 months; 0 otherwise.	0.112	0.315	0.099	0.298
Local urban *Hukou*	Dummy variable taking the value of 1 if the worker has a local urban *Hukou* and 0 otherwise.	0.972	0.164	0.035	0.184
City-level insurance coverage for the study population[d]	The city average proportion of workers obtaining a full package of employee benefits including 4 social insurances (unemployment, pension, injury and housing).	0.359	0.015	0.186	0.103

Note: a. All statistics are the averages of two waves.

b. It includes those ending with unemployment in the 2009 wave as we have right-censored data in duration models. Excluding those right-censored data, the mean is 0.155 for urban workers and 0.229 for migrants.

c. City-level data are compiled from China City Statistical Yearbooks published annually by the National Bureau of Statistics of China.

d. The mean is the same as that of "social insurance" as it is the average of the latter at the city-level and then across all sample cities. The standard deviations are different between two variables though.

Table 2 Geographic and gender distribution

Province	City	2008				2009			
		Urban (%)	Migrants (%)	Male (%)	Female (%)	Urban (%)	Migrants (%)	Male (%)	Female (%)
Guangdong	Guangzhou	136 (6.96)	175 (10.17)	168 (8.92)	143 (8.06)	136 (6.96)	129 (10.52)	135 (7.17)	130 (7.33)
	Dongguan	119 (6.09)	126 (7.33)	136 (7.22)	107 (6.03)	119 (6.09)	86 (7.00)	124 (6.59)	79 (4.45)
	Shenzhen	110 (5.63)	60 (3.49)	87 (4.62)	83 (4.68)	110 (5.63)	60 (4.89)	83 (4.41)	87 (4.90)
Henan	Zhengzhou	128 (6.55)	126 (7.33)	134 (7.12)	118 (6.65)	128 (6.55)	99 (8.06)	114 (6.05)	111 (6.23)
	Luoyang	59 (3.02)	59 (3.43)	57 (3.03)	60 (3.38)	59 (3.02)	43 (3.50)	49 (2.60)	52 (2.93)
	Anyang	31 (1.59)	–	12 (0.64)	19 (1.07)	31 (1.59)	–	12 (0.64)	19 (1.07)
Anhui	Hefei	107 (5.48)	143 (8.31)	139 (7.38)	110 (6.20)	107 (5.48)	108 (8.79)	113 (6.00)	101 (5.69)
	Bengbu	42 (2.15)	88 (5.12)	69 (3.66)	60 (3.38)	42 (2.15)	48 (3.91)	47 (2.50)	42 (2.37)
Chongqing	Chongqing	151 (7.73)	72 (4.19)	95 (5.05)	126 (7.10)	151 (7.73)	87 (7.08)	111 (5.89)	125 (7.05)
Shanghai	Shanghai	281 (14.38)	174 (10.12)	231 (12.27)	219 (12.34)	281 (14.38)	141 (11.48)	208 (11.05)	209 (11.78)
Jiangsu	Nanjing	152 (7.78)	135 (7.85)	152 (8.07)	135 (7.61)	152 (7.78)	78 (6.35)	124 (6.59)	106 (5.98)
	Wuxi	87 (4.45)	120 (6.98)	93 (4.94)	112 (6.31)	87 (4.45)	55 (4.48)	70 (3.72)	70 (3.95)
Zhejiang	Hangzhou	121 (6.19)	114 (6.63)	130 (6.90)	105 (5.92)	121 (6.19)	80 (6.51)	112 (5.95)	89 (5.02)
	Ningbo	68 (3.48)	35 (2.03)	44 (2.34)	58 (3.27)	68 (3.48)	45 (3.66)	54 (2.87)	58 (3.27)
Hubei	Wuhan	157 (8.03)	189 (10.99)	172 (9.13)	174 (9.80)	157 (8.03)	96 (7.82)	127 (6.74)	126 (7.10)
Sichuan	Chengdu	140 (7.16)	104 (6.05)	143 (7.59)	101 (5.69)	140 (7.16)	73 (5.94)	123 (6.53)	90 (5.07)
	Mianyang	49 (2.51)	–	16 (0.85)	33 (1.86)	49 (2.51)	–	16 (0.85)	33 (1.86)
	Leshan	16 (0.82)	–	5 (0.27)	11 (0.62)	16 (0.82)	–	5 (0.27)	11 (0.62)
Total		1,954 (100)	1,720 (100)	1,883 (100)	1,774 (100)	1,954 (100)	1,228 (100)	1,627 (100)	1,538 (100)

Note: " - " means no data.

Table 3 Distribution of contract status of the primary job

Category	2008				2009			
	Urban (%)	Migrant (%)	Male (%)	Female (%)	Urban (%)	Migrant (%)	Male (%)	Female (%)
Contract								
Permanent	234 (16.34)	102 (6.59)	184 (11.10)	141 (10.44)	235 (15.93)	80 (16.88)	170 (16.25)	145 (16.06)
Long term (≥ 1 year)	790 (55.17)	499 (32.40)	717 (43.24)	576 (42.64)	904 (61.29)	211 (44.51)	607 (58.03)	508 (56.26)
Short term (<1 year)	165 (11.52)	138 (8.94)	144 (8.69)	157 (11.62)	87 (5.90)	53 (11.18)	71 (6.79)	69 (7.64)
Sub-total	1,189 (83.03)	756 (47.93)	1,045 (63.03)	874 (64.69)	1,226 (83.12)	344 (72.57)	848 (81.07)	722 (79.96)
Non-contract								
Temporary	129 (9.01)	274 (17.63)	202 (12.18)	211 (15.62)	138 (9.36)	107 (22.57)	124 (11.85)	121 (13.40)
Others[a]	114 (7.96)	543 (34.44)	411 (24.79)	266 (19.69)	111 (7.53)	23 (4.85)	74 (7.07)	60 (6.64)
Sub-total	243 (16.97)	821 (52.07)	613 (36.97)	477 (35.31)	249 (16.88)	130 (27.43)	198 (18.93)	181 (20.04)
Total employed	1,432 (100)	1,577 (100)	1,658 (100)	1,351 (100)	1,475 (100)	474 (100)	1,046 (100)	903 (100)

Note: a. The "Others" category includes non-wage workers, part-time jobs, other kinds of jobs, and missing values in contract status for local urban workers. It includes family business helper without pay, part-time jobs, probationary period, and missing values in contract status for migrant workers.

Table 4 Coverage of employer-provided social insurance

Insurance	2008				2009			
	Urban (%)	Migrant (%)	Male (%)	Female (%)	Urban (%)	Migrant (%)	Male (%)	Female (%)
Unemployment	778 (54.33)	208 (13.19)	512 (30.88)	474 (35.09)	877 (59.46)	73 (15.40)	512 (48.95)	438 (48.50)
Pension	989 (69.06)	285 (18.07)	668 (40.29)	606 (44.86)	1,037 (70.31)	104 (21.94)	609 (58.22)	532 (58.91)
Injury	704 (49.16)	278 (17.63)	538 (32.45)	444 (32.86)	789 (53.49)	97 (20.46)	501 (47.90)	385 (42.64)
House	572 (39.94)	133 (8.43)	372 (22.44)	333 (24.65)	634 (42.98)	36 (7.59)	370 (35.37)	300 (33.22)
All	424 (29.61)	107 (6.79)	282 (17.01)	249 (18.43)	480 (32.54)	20 (4.22)	279 (26.67)	221 (24.47)
Total employment	1,432 (100)	1,577 (100)	1,658 (100)	1,351 (100)	1,475 (100)	474 (100)	1,046 (100)	903 (100)

Table 5 Distribution of transitions in the labor market

No. of transitions	Transition	Urban (%)	Migrant (%)	Male (%)	Female (%)
1	Employed->unemployed	367 (18.78)	123 (5.43)	166 (7.57)	323 (16.07)
1	Unemployed->employed	1,264 (64.69)	2,021 (89.23)	1,803 (82.26)	1,473 (73.28)
	of which "always employed"[a]	130 (6.65)	9 (0.40)	0 (0.00)	130 (6.47)
Subtotal		1,631 (83.47)	2,144 (94.66)	1,969 (89.83)	1,796 (89.35)
2	Employed->unemployed->employed	182 (9.31)	6 (0.26)	89 (4.06)	99 (4.93)
2	Unemployed->employed->unemployed	25 (1.28)	24 (1.06)	24 (1.09)	24 (1.19)
Subtotal		207 (10.59)	30 (1.32)	113 (5.15)	123 (16.57)
3	Unemployed->employed->unemployed ->employed[b]	116 (5.94)	91 (4.02)	110 (5.02)	91 (4.53)
Subtotal		116 (5.94)	91 (4.02)	110 (5.02)	91 (4.53)
Total		1,954 (100)	2,265 (100)	2,192 (100)	2,010 (100)

Note: a. "Always employed" means those who became employed in 2000 (as we dropped individuals who obtained jobs prior to it) for all observations, and have stayed in employment throughout the sample time period. There are no "always unemployed" individuals who transited in unemployment in 2005 (as we dropped individuals who had been unemployed for more than 36 months) and stayed in this status throughout the sample period.

b. There are no observations following the three transitions as "unemployed->employed->unemployed->employed".

Table 6 Homogenous treatment effect of the LCL

Independent variable	Urban	Migrant	Male	Female
	(1)	(2)	(3)	(4)
Unemployment->employment				
Ln(unemployment duration)	-0.443 (0.077)***	-0.020 (0.110)	-0.423 (0.121)***	-0.302 (0.097)***
Treatment	-0.185 (0.065)***	0.070 (0.120)	-0.159 (0.091)***	-0.102 (0.106)
Log-likelihood	-5,125.174	-1,471.281	-2,106.616	-2,060.712
Employment->unemployment				
Ln(employment duration)	0.863 (0.042)***	1.207 (0.082)***	1.064 (0.052)***	0.593 (0.035)***
Treatment	3.148 (0.106)***	2.389 (0.154)***	3.031 (0.122)***	2.667 (0.114)***
Log-likelihood	-7,481.184	-2,597.376	-5,556.652	-4,978.626

Note: ***, ** and * denote 1%, 5%, and 10% significance levels separately.

Table 7 Unemployment duration-dependent treatment effect of the LCL, by type of workers

Interval	Urban				Migrant			
	Unemployment (1)	Employment (2)	Wage (3)	Insurance (4)	Unemployment (5)	Employment (6)	Wage (7)	Insurance (8)
D_i×1 month	-3.286 (1.414)**	-4.545 (2.313)*	2.789 (1.153)**	2.080 (1.849)	-7.583 (3.297)**	-17.946 (8.596)**	-4.265 (1.672)**	1.163 (0.700)*
D_i×2 months	-1.166 (3.170)	-3.019 (1.011)***	1.926 (1.110)*	2.186 (1.485)	-0.747 (0.841)	-19.020 (10.201)*	-3.676 (2.176)*	0.979 (0.677)
D_i×3 months	-1.517 (3.746)	3.965 (2.488)	1.108 (1.531)	1.997 (2.044)	-0.806 (1.346)	2.829 (-)	-2.697 (2.506)	1.166 (0.618)*
D_i×4 months	2.743 (3.065)	0.955 (2.652)	1.621 (1.234)	1.237 (1.636)	-1.632 (1.257)	0.619 (-)	4.446 (3.680)	1.220 (0.685)*
D_i×5 months	2.364 (3.164)	4.443 (2.703)*	2.606 (1.508)*	1.599 (1.673)	1.527 (1.694)	0.218 (-)	-3.480 (2.386)	2.011 (0.964)**
D_i×6 months	2.287 (3.960)	1.931 (2.372)	1.576 (1.464)	1.550 (1.797)	2.021 (2.449)	2.483 (-)	-8.896 (15.860)	1.382 (0.617)**
D_i×7 months	-1.026 (3.005)	-5.843 (13.310)	-8.438 (-)	1.744 (1.644)	-	-	-	-
D_i×8 months	-1.598 (-)	-	-	-	-	-	-	-
D_i×9 months	1.872 (3.197)	0.115 (-)	3.723 (3.140)	-	-	-	-	-
D_i×10 months	2.368 (4.149)	3.453 (-)	10.197 (59.504)	-2.930 (1.706)*	1.751 (4.314)	0.024 (-)	-0.517 (236.678)	-1.167 (1.102)
D_i×11 months	-	-	-	-	-	-	-	-
D_i×12 months	2.416 (3.667)	0.076 (-)	3.604 (3.246)	-2.459 (1.762)	2.026 (2.013)	-24.812 (8.982)	-9.063 (38.758)	-0.649 (0.806)
D_i×13 months	2.855 (3.047)	3.385 (-)	1.721 (4.129)	-2.669 (1.493)*	1.765 (2.056)	0.821 (-)	-4.422 (5.449)	-0.807 (0.948)
D_i×14 months	3.314 (4.366)	0.076 (-)	-6.487 (-)	-	-	-	-	-
D_i×15 months	-	-	-	-	-	-	-	-
D_i×16 months	-1.063 (35.237)	0.525 (-)	1.128 (4.317)	-	-	-	-	-
D_i×17 months	-	-	-	-	-	-	-	-
D_i×18 months	-2.024 (1.775)	0.386 (-)	8.626 (12.472)	-1.222 (1.705)	-	-	-	-
D_i×19 months	2.329 (2.837)	-2.921 (12.725)	2.678 (3.491)	-2.325 (1.977)	-	-	-	-
D_i×20 months	3.109 (3.103)	0.610 (-)	1.359 (3.672)	-2.140 (1.575)	-	-	-	-
D_i×21 months	2.828 (3.677)	-1.102 (-)	2.713 (3.217)	-1.458 (1.630)	-	-	-	-

Note: ***, ** and * denote 1%, 5%, and 10% significance levels separately. " - " means no estimator. Each one of the intervals 1-18 represents 1 month in elapsed unemployment and the each one of the remaining intervals represent 6 months in elapsed unemployment.

Table 8 Unemployment duration-dependent treatment effect of the LCL, by gender

Interval	Male				Female			
	Unemployment (1)	Employment (2)	Wage (3)	Insurance (4)	Unemployment (5)	Employment (6)	Wage (7)	Insurance (8)
D_i×1 month	-10.096 (4.065)**	-3.773 (1.063)***	5.708 (2.118)***	1.116 (0.837)	-4.925 (2.618)*	-5.087 (2.558)**	-0.423 (0.319)	0.250 (0.276)
D_i×2 months	-1.645 (1.321)	-4.117 (1.189)***	3.695 (2.077)*	0.827 (0.795)	1.762 (1.384)	-5.321 (2.082)*	-0.321 (0.375)	0.256 (0.272)
D_i×3 months	-1.656 (3.047)	-1.262 (-)	4.408 (4.125)	1.056 (0.833)	-2.027 (3.194)	4.010 (-)	-1.849 (1.679)	0.588 (0.364)
D_i×4 months	2.382 (3.460)	-0.012 (-)	3.203 (3.055)	0.678 (0.964)	-1.932 (4.122)	3.109 (-)	-0.661 (1.729)	-0.122 (0.286)
D_i×5 months	-1.544 (3.413)	-0.945 (-)	-9.492 (-)	1.893 (1.109)*	-2.404 (3.469)	3.968 (-)	0.819 (1.906)	0.469 (0.343)
D_i×6 months	1.978 (4.549)	-0.205 (-)	3.917 (3.721)	0.794 (0.887)	1.659 (3.347)	5.302 (-)	-1.137 (1.275)	0.025 (0.360)
D_i×7 months	-	-	-	-	1.358 (3.652)	-7.101 (8.765)	-10.600 (-)	-0.246 (0.296)
D_i×8 months	-	-	-	-	-	-	-	-
D_i×9 months	-	-	-	-	1.693 (3.355)	-0.171 (-)	10.043 (-)	-
D_i×10 months	2.626 (4.031)	-0.227 (-)	5.362 (4.528)	1.510 (1.210)	-	-	-	-
D_i×11 months	-	-	-	-	-	-	-	-
D_i×12 months	3.046 (3.253)	-31.251 (-)	4.514 (4.143)	0.895 (1.080)	2.014 (3.552)	1.726 (-)	-0.611 (2.241)	0.448 (1.149)
D_i×13 months	2.899 (3.976)	1.351 (-)	5.322 (3.807)	1.829 (1.042)*	1.811 (3.289)	3.925 (-)	-1.711 (1.586)	0.111 (0.126)
D_i×14 months	3.064 (6.147)	-1.619 (-)	-2.918 (-)	-	-	-	-	-
D_i×15 months	-	-	-	-	-	-	-	-
D_i×16 months	-	-	-	-	-3.822 (5.826)	1.574 (-)	-2.525 (4.451)	-
D_i×17 months	-	-	-	-	-	-	-	-
D_i×18 months	-	-	16.501 (51.725)	-	-3.302 (5.849)	-	6.833 (-)	0.143 (0.108)
D_i×19 months	3.557 (4.630)	-	13.360 (43.795)	-1.800 (1.111)	1.474 (4.133)	-	-1.096 (1.351)	0.088 (0.092)
D_i×20 months	2.990 (4.170)	-	3.023 (4.798)	-1.543 (0.923)*	1.742 (3.333)	-	-11.674 (-)	-
D_i×21 months	3.278 (4.081)	-	6.920 (3.418)**	-	1.402 (3.185)	-	-9.224 (-)	0.599 (0.817)

Note: ***, ** and * denote 1%, 5%, and 10% significance levels separately. " - " means no estimator. Each one of the intervals 1-18 represents 1 month in elapsed unemployment and the each one of the remaining intervals represent 6 months in elapsed unemployment.

Table 9 Estimation results of other correlates, by type of workers

Independent variables	Urban				Migrant			
	Unemployment (1)	Employment (2)	Wage (3)	Insurance (4)	Unemployment (4)	Employment (5)	Wage (6)	Insurance (7)
Demographics								
Gender	0.022 (0.090)	0.053 (0.124)	0.179 (0.093)*	0.146 (0.087)*	0.216 (0.104)**	0.069 (0.133)	0.151 (0.149)	0.149 (0.105)
Age	0.014 (0.005)***	0.012 (0.010)	-0.032 (0.015)**	-0.010 (0.007)	-0.094 (0.103)	-0.008 (0.012)	-0.028 (0.015)*	-0.006 (0.003)**
Age × treatment	-0.0002 (0.001)	-0.041 (0.048)	0.009 (0.016)	0.027 (0.021)	-0.131 (0.164)	-0.060 (0.032)*	-0.059 (0.024)**	0.005 (0.003)*
Edu.	-0.032 (0.015)**	0.051 (0.020)**	0.351 (0.297)	0.052 (0.041)	-0.056 (0.024)**	-0.035 (0.032)	0.219 (0.271)	0.020 (0.008)**
Edu. × treatment	0.006 (0.044)	-0.283 (0.164)*	-0.009 (0.042)	0.006 (0.024)	0.092 (0.050)	-0.059 (0.148)	-0.147 (0.053)***	0.022 (0.077)
Dependency ratio	-0.021 (0.112)	0.038 (0.153)	1.464 (0.961)	0.031 (0.038)	0.061 (0.200)	-0.079 (0.195)	0.110 (0.280)	0.020 (0.041)
Occupation								
Professional	-0.002 (0.242)	-0.636 (0.298)**	0.040 (0.319)	0.387 (0.596)	0.069 (1.005)	7.349 (80.862)	4.317 (3.329)	0.150 (0.088)*
Management	0.014 (0.286)	-0.726 (0.352)**	0.624 (0.302)**	0.160 (0.338)	0.034 (0.796)	9.979 (49.532)	-0.168 (1.024)	-0.018 (0.018)
Manual	0.005 (0.187)	-0.424 (0.287)	0.152 (0.261)	0.722 (0.496)	0.015 (0.104)	2.337 (1.730)	-0.168 (0.718)	0.188 (0.368)
Industry								
Construction	-4.991 (4.431)	0.535 (1.285)	0.411 (0.348)	0.739 (0.412)**	-11.323 (58.525)	2.481 (1.624)	0.145 (0.129)	0.057 (0.335)
Manufacturing	-5.818 (4.915)	0.587 (0.919)	1.563 (0.955)*	0.677 (0.484)	-12.272 (56.508)	2.790 (1.156)**	-3.093 (0.614)***	0.058 (0.345)
Services	-5.533 (3.328)*	0.781 (1.329)	2.830 (2.852)	0.039 (0.029)	-9.590 (48.967)	2.239 (1.047)**	-0.227 (0.668)	0.282 (0.389)
Government	-6.606 (3.646)*	0.602 (1.183)	1.499 (2.535)	0.265 (0.493)				
City-level economic conditions								
Ln(city GDP per capita)	-0.045 (0.081)	0.009 (0.094)	1.059 (0.533)**	0.286 (0.287)	-0.095 (0.089)	0.170 (0.132)	0.216 (0.222)	0.175 (0.217)
Ln(city GDP per capita) × treatment	-0.291 (0.273)	0.560 (0.951)	-0.258 (0.304)	0.105 (0.143)	-0.147 (0.366)	2.433 (0.771)***	0.630 (0.389)	0.071 (0.056)
Ln(city export per capita)	-0.130 (0.398)	-1.364 (0.347)***	6.014 (2.068)***	-3.971 (0.628)***	-1.069 (1.290)	-0.083 (0.095)	3.065 (3.432)	0.670 (0.622)
Ln(city export per capita) × treatment	-1.057 (7.351)	-0.257 (17.917)	8.301 (5.557)	-0.681 (5.001)	-3.110 (8.202)	42.009 (20.147)**	2.526 (8.585)	-0.396 (0.962)
Direct time control								
Time before Jan. 2008	-0.065 (0.060)	-1.718 (2.721)	0.262 (0.172)	0.124 (0.106)	-0.064 (0.080)	-0.295 (0.189)	0.345 (0.249)	-0.033 (0.022)
Time after Jan. 2008	-0.025 (0.182)	1.892 (0.914)**	-0.579 (1.043)	0.017 (0.015)	0.029 (0.215)	0.620 (0.489)	0.574 (0.495)	-0.024 (0.022)
Additional instruments								
Employment length (no. of months)			1.464 (0.961)				-1.200 (1.097)	
Ln(monthly subsidies)			1.949 (2.342)				0.242 (0.880)	
Health			-0.877 (0.787)	-0.492 (0.896)			-0.881 (0.909)	-0.495 (0.759)
Local urban *Hukou*				-0.0003 (0.0004)				0.003 (0.006)
City-level insurance coverage				0.461 (0.481)				0.136 (0.165)

Note: ***, ** and * denote 1%, 5%, and 10% significance levels separately.

Table 10 Estimation results of other correlates, by gender

Independent variables	Male				Female			
	Unemployment (1)	Employment (2)	Wage (3)	Insurance (4)	Unemployment (5)	Employment (6)	Wage (7)	Insurance (8)
Demographics								
Age	0.005 (0.007)	-0.012 (0.008)	-0.025 (0.007)***	-0.906 (0.543)*	-0.272 (0.853)	-0.002 (0.008)	-1.539 (0.827)*	-1.236 (0.536)**
Age × treatment	-0.030 (0.011)***	-0.048 (0.026)*	-0.005 (0.016)	0.012 (0.039)	0.002 (0.022)	-0.081 (0.040)**	-0.208 (0.268)	0.005 (0.004)
Edu.	-0.106 (0.017)***	-0.065 (0.045)	0.081 (0.045)*	0.037 (0.045)	-0.057 (0.025)**	-0.040 (0.022)*	0.165 (0.212)	0.032 (0.038)
Edu. × treatment	0.012 (0.048)	0.114 (0.141)	-0.057 (0.039)	-0.033 (0.029)	0.036 (0.051)	-0.180 (0.105)*	-0.063 (0.060)	0.010 (0.011)
Dependency ratio	-0.019 (0.119)	0.101 (0.220)	-0.022 (0.125)	0.086 (0.181)	1.240 (1.742)	-0.067 (0.228)	-0.052 (0.152)	0.074 (0.040)*
Occupation								
Professional	0.025 (0.162)	0.499 (0.256)**	0.875 (1.391)	0.310 (0.576)	0.225 (0.184)	-0.191 (0.233)	0.556 (0.348)	0.176 (0.113)
Management	0.052 (0.254)	0.587 (0.322)*	0.946 (0.858)	-0.005 (0.023)	-0.060 (0.355)	-0.149 (0.491)	0.679 (0.439)	-0.054 (0.027)**
Manual	0.041 (0.119)	0.692 (0.421)*	0.800 (1.104)	-0.154 (0.301)	0.017 (0.164)	0.346 (0.179)*	-0.228 (0.408)	0.750 (0.462)*
Industry								
Construction	-1.461 (1.051)	3.355 (1.735)*	0.659 (0.595)	-0.316 (0.305)	-0.581 (0.986)	1.081 (1.308)	0.570 (0.896)	0.742 (0.420)*
Manufacturing	-1.774 (1.003)*	2.641 (1.508)*	1.263 (1.758)	-0.247 (0.402)	-0.554 (0.875)	1.269 (1.128)	2.148 (3.353)	0.582 (0.504)
Services	-2.010 (1.163)*	3.443 (1.382)**	2.304 (1.846)	-0.288 (0.430)	-0.652 (0.849)	1.167 (0.979)	2.806 (2.972)	0.974 (0.560)*
Government	-1.455 (1.120)	3.125 (2.859)	1.568 (2.215)	-0.243 (0.483)	-0.669 (0.861)	1.146 (1.059)	1.801 (3.041)	0.916 (1.119)
City-level economic conditions								
Ln(city GDP per capita)	-0.082 (0.090)	0.045 (0.075)	0.771 (0.557)	0.169 (0.354)	-0.062 (0.097)	0.109 (0.086)	0.888 (0.365)**	0.268 (0.233)
Ln(city GDP per capita) × treatment	-0.299 (0.299)	2.424 (1.626)	-0.348 (0.340)	0.090 (0.101)	-0.167 (0.332)	0.453 (0.547)	0.163 (0.449)	-0.039 (0.089)
Ln(city export per capita)	-0.064 (0.513)	-0.534 (0.345)	4.740 (2.892)*	-0.671 (0.686)	-0.101 (0.379)	-0.418 (0.373)	5.085 (3.451)	-0.879 (0.812)
Ln(city export per capita) × treatment	-3.840 (6.701)	41.766 (16.027)***	-0.368 (8.467)	2.317 (1.624)	-1.703 (6.823)	17.191 (21.374)	14.102 (7.455)*	-0.585 (1.605)
Direct time control								
Time before Jan. 2008	-0.062 (0.055)	-0.961 (0.320)***	0.178 (0.072)**	0.887 (0.472)*	-0.057 (0.078)	-1.083 (0.203)***	0.271 (0.339)	0.015 (0.016)
Time after Jan. 2008	-0.179 (0.159)	1.967 (0.827)**	-0.319 (0.130)**	-0.030 (0.035)	-0.113 (0.220)	1.889 (0.365)***	-0.783 (0.987)	-0.041 (0.043)
Additional instruments								
Employment length			1.242 (0.497)**				1.205 (0.704)*	
Ln(monthly subsidies)			2.539 (1.244)**				-5.082 (4.733)	
Health			-0.787 (0.878)	-0.586 (0.636)			-0.683 (0.830)	-0.439 (0.667)
Local urban *Hukou*				0.011 (0.007)				0.151 (0.092)*
City-level insurance coverage				0.188 (0.083)**				0.257 (0.092)***

Note: ***, ** and * denote 1%, 5%, and 10% significance levels separately.