Impact Evaluation of Labor Contract Law Enforcement to Firms' Hiring Cost

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Abstract

This paper empirically examines the impact of Labor Contract Law (LCL) enforcement on Chinese firms' hiring costs for each industry. In the model of wage determination, LCL increases the hiring cost by raising payroll tax and reducing job destruction rate. But the consequential decrease in job-finding rate could cut the pre-tax wage of workers who have high-bargaining power. With provincial-level panel data from 2003 to 2014, I regress LCL enforcement as a treatment to salaries after 2008, and use two instrumental variables, maternity insurance coverage and incidence of contract termination dispute, to identify its influence. The results show that LCL positively correlated to the hike of hiring cost in the manufacturing sector, and negatively contributed to the pre-tax wage growth in industries that are dominated by state-owned firms.

1 Introduction

The economic consequence of Labor Contract Law (henceforth referred to as LCL), which went into effect in January 2008, has been a controversial topic in China. Government officials claim that LCL improves corporate governance, capital-labor relations, and total productivity. But public opinion, including that of economist Steven Ng-Sheong Cheung and former Minister of Finance

Lou Jiwei, has been critical of this employment protection legislation, citing the reduction of flexibility of the labor market and harm to the industries that arises as a result. In academia, existing research on LCL also presents divergent findings. Based on different kinds of surveys across the country, some studies show that the standard labor contract has increased workers' wages and social security benefits significantly, especially for those low-wage migrant workers (Chen and Liu, 2010; Freeman and Li, 2013; Gao et al.,2017), while some other papers claim that LCL has minimal impact on wages and social security coverage (Gallagher et al., 2013; Qing and Liu, 2014). Even in the same area of Guangdong province (Pearl River Delta), Han et al. (2011)'s investigation found labor costs per worker were increased up to 5% by LCL in sample firms; still, Freeman and Li (2013) estimated that without LCL firms could save 20 - 30% of labor costs.

This paper provides empirical evidence of the correlation of LCL enforcement and firms' hiring costs in different sectors of the economy. Here hiring cost is equivalent to workers' pre-tax wage. I start with a textbook model of labor market equilibrium (Pissarides, 2000) to show that wages are determined by a combination of output level, income tax rate, workers' bargaining power, job-finding rate, and destruction rate. There are three possible channels by which the change of legislation could affect the equilibrium wage: First, mandatory payment of social security increases payroll tax, which directly increases the pre-tax salary; second, new measures of employment protection cuts the job destruction rate, which also raises the hiring cost; third, a decrease of job finding rate comes after the decrease of destruction rate, so firms spend less on workers with high wage bargaining power and spend more on workers with low bargaining power. The last channel diverges the impact of LCL on different industries. Intuitively, workers in labor-intensive sectors have limited bargaining power; LCL makes firms' hiring costs increase. On the other hand, workers in skill-specific sectors usually have higher bargaining power, and the drop in job-finding rate reduces their pre-tax wage.

The empirical results are consistent with the theory. I gathered provincial-level pre-tax wages of 19 industries from the *China Labor Statistical Yearbook*

and Statistical Bureau databases, then took LCL enforcement as a dummy treatment of the wages after the year 2008. A primary concern here is that output level is the only observable explanatory variable among the determinants of wage, therefore the dummy treatment can be endogenous to the unobserved income tax rate, job finding, and destruction rates. I propose two instrument al variables that are exclusively correlated with labor law and independent of wage negotiation, to identify the impact of LCL. The first instrument is the maternity insurance participation rate (henceforth referred to as MI), which takes 0.8% of hiring costs but is compulsory for all workers regardless of gender and age. The second is the incidence of contract termination dispute (henceforth referred to as CTD), of which the only legal bases are old and new labor law. CTD were dropped temporarily after LCL enforcement. 2SLS regression with these two instruments is verified to provide a more consistent estimation than pooled OLS with the dummy variable. The results show that LCL does not have a significant impact on the average wage of the whole economy. But it positively associates with the increase of hiring costs in the manufacturing industry, and negatively contributes to the salary increase in finance and education sectors.

In addition, hiring costs are also categorized by firms' ownership. There are three types of firm: State-owned, collectively-owned, and other ownership, among which the state-owned firms provide the highest salaries, and collective firms provide the lowest. Using MI and CTD as instruments, 2SLS estimations find LCL enforcement decreases the growth of state-owned firms' average hiring costs, and increases the growth of collective firms' pre-tax wages. At the industrial-level, LCL raises the pre-tax wages of collectively-owned and other firms, which take a quarter of urban employment in China. And it significantly reduces the hiring cost growth of seven kinds of state-owned companies, including construction, retail, finance, research, education, and public administration. This broad impact can be explained by state-owned firms' socialism feature. They usually enjoy low tax rates and rarely dismiss employees. Therefore, LCL only affect hiring costs through the change of job finding rate, yet because of the flat tax rate, a decrease of the job finding rate leads to a wage cut.

In conclusion, this paper finds a diverged impact of Labor Contract Law on firms' hiring costs in different sectors of the economy: LCL positively correlated to the hike in hiring costs in the manufacturing industry, and negatively contributed to the pre-tax wage in skill-specific industries and state-owned firms. This result contributes to the literature by providing the macro- and industrial-level evidence of the market consequences of employment protection legislation (henceforth referred to as EPL) in developing economies. The rest of the paper is organized as follows: Section 2 shows the literature on EPL and stylized facts of the Chinese labor market; Section 3 outlines the basic model of hiring cost determination and the possible channels by which LCL affect the wage; in Section 4 I explain the data and the identification strategy; Section 5 exhibits the empirical results by OLS and 2SLS of each industry; Section 6 is robustness check; and Section 7 is a further discussion and conclusion.

2 Stylized Facts of LCL

2.1 Employment protection in developing countries

By OECD, employment protection legislation is defined as "regulations concerning both hiring (for instance, rules favoring disadvantaged groups, conditions for using temporary or fixed-term contracts, training requirements) and firing (for instance, redundancy procedures, mandated prenotification periods and severance payments, special requirements for collective dismissals and short-time work schemes)"[1]. In developed countries, labor economists believe that EPL could lower wage inequality (Freeman, 2007), stabilize employment over the economic cycle and enhance employee performance in the long run (Amable, Demmou and Gatti, 2007). But for developing economies, the effectiveness of EPL is not apparent, as empirical literature provides passive evidence. For example, a series of studies on the Indian manufacturing sector (Fallon and Lucas, 1993; Besley and Burgess, 2004; Ahsan and Pages, 2009;) find that pro-worker

[1] quote from https://stats.oecd.org/glossary/detail.asp?ID=3534

legislation squeezes out capital investment, and decreases output and employment. Almeida and Carneiro (2007) show that stricter enforcement of EPL increases firms' total labor costs and workers' non-wage benefits, but decreases the wage premium of formal workers to informal workers, by using city-level data from Brazil. The World Development Report 2013 claimed that "there is no consensus on what the content of labor policies should be", but "either misguided intervention or lack of voice and social protection should be avoided" (WDR, 2013, page 26).

In China, the employment protection, which is based on Labor Law (1995) and LCL(2008), has been criticized for its lack of flexibility (in terms of dismissing individuals, Boquen 2019) and collective bargaining power ("in the absence of independent trade union", Wang et al. 2009). The latest OECD EPL index (2012 to 2015, Table 1, which "measures the procedures and costs involved in hiring and dismissing workers"[2]), shows that Chinese EPL performs much better than world and OECD average in protecting permanent individual employment, but performs poorly in protecting collective or temporary workers. Another critical feature of the Chinese judicial system, which adopts a civil law framework, is that local governments and courts have high autonomy; different courts and arbitration institutions usually have different interpretations on the same legal issue (Cooney, 2009). Therefore the EPL compliance is likely to have different impacts across the country.

2.2 Features of LCL

Labor Contract Law, as the name implies, requires every employer to sign a standard written contract which specifies working hours, remuneration, social security payments, and layoff conditions for every employee. It is an amendment to the old version of Labor Law, which was enacted in 1995. Both old and new laws claim that "a labor contract should be set up when establishing a labor relationship" (Article 16 of Labor Law, Article 10 of LCL), and temporary or

[2]resource: http://www.oecd.org/els/emp/oecdindicatorsofemploymentprotection.htm

informal workers used to work with an oral contract under Labor Law 1995. However, LCL adds clauses that "a written labor contract should be set up within one month after the employment start". In other words, after 2008, LCL requires every temporary employment relationship to have a written contract with labor dispatch agencies; also, the term limit of the trial period is six months by old law and one month by LCL. Therefore LCL is more binding than old labor law on establishing a formal employment relationship.

Figure 1 shows the incident (out of 10,000 workers) of labor litigation and litigant before and after LCL implementation. The rates peaked in 2008, which can be attributed to the double shock of LCL implementation and the global financial crisis. On the other hand, the labor litigation is categorized into four types: wage disputes, social security disputes, contract termination (layoff) disputes, and others. Figure 2 indicates that the rate of contract termination disputes declined dramatically in 2009 and 2010, which is abnormal after an economic shock, and can only be explained by the new labor law enforcement as it increases firms' costs in contract termination. In practice, if a firm hired a worker in February 2007 and dismissed him or her in October 2007, by old labor law, there was usually no compulsory contract at the beginning of hiring. If there was a contract, the content on dismissal conditions were generally vague. Therefore firms could easily cut down the real hiring period, which was proportional to compensation. In either case, the labor dispute could be settled at a low price, and social security payment was not involved. But if this worker was hired in February 2008 and dismissed nine months later, by LCL, the firm had to defray his or her social security insurance for nine months and pay one more month's salary as economic compensation. As a result of increased severance pay, there was a temporary drop in contract termination.

LCL also regulates the format of the employment contract with more specified details. Table 2 compares the differences of Labor Law 1995 and LCL 2008 in mandatory terms of the contract. It implies that besides documentary setups, the main change is the added term of social security insurance payment. In China, depending on local regulation, the rate of social insurance accounts for

35 - 45% of pre-tax wage[3]. Therefore, if the disposable salary is sticky, mandatory social security participation substantially increases employers' hiring costs. However, between 2003 and 2014, salaries in the Chinese market increased with economic booming; this paper assumes that employers and employees renegotiate the wage every year.

3 Model of Hiring cost Determination

The first part of this section highlights a standard labor market equilibrium model of wage determination, which follows the textbook of *Equilibrium Unemployment Theory* (Pissarides, 2000, Chapter 1.4). The second part explains how LCL enforcement could affect wages through the possible change of payroll tax rate, workers' bargaining power, discount rate, job destruction rate, and job-finding rate.

3.1 the Model

Denote the expected lifetime payoff of employed worker as I^L and unemployed worker as I^U. By Bellman equation, I^L and I^U are constant at steady state, therefore

$$\begin{cases} (1+r)I^U = pI^L + (1-p)I^U \\ (1+r)I^L = (1-h)w + \delta I^U + (1-\delta)I^L \end{cases} \tag{1}$$

Here w is the pre-tax salary, h is income tax rate plus payroll tax rate, thereby $(1-h)w$ is workers' disposable wage; p is job finding rate; δ is job destruction rate; r is discount rate. Without losing of generality, I assume the unemployment benefit equals to zero. Rearrange equation (1) we have

$$I^U = \frac{p(1-h)w}{r(r+\delta+p)} \tag{2}$$

$$I^L = \frac{(r+p)(1-h)w}{r(r+\delta+p)} \tag{3}$$

[3]pension 22 - 28%, medical insurance 10 - 13% , unemployment insurance 1 - 3%, injury insurance 0.5 - 2% , maternity insurance 0.8%

On the other hand, for firms, denote the value of a filled job as I^J and value of a vacancy as I^V. By Bellman's equation, I^J and I^V are constants at steady state:

$$I^J = \frac{(r+q)(y-w) - \delta\kappa}{r(r+\delta+q)} \tag{4}$$

$$I^V = \frac{q(y-w) - (r+\delta)\kappa}{r(r+\delta+q)} \tag{5}$$

Here y is the output of a filled job; κ is the cost of posting a job vacancy; q is vacancy matching rate. Notice that vacancies will only be created when its value is non-negative, therefore $I^V = 0$ and

$$I^J = \frac{\kappa}{q} = \frac{y-w}{r+\delta} \tag{6}$$

For filled jobs, assume that hiring cost is determined by a Nash-bargaining process which maximizes the weighted total surplus of firm and worker:

$$w = \arg\max_w (I^L - I^U)^\beta (I^J - I^V)^{1-\beta} \tag{7}$$

here $0 \leq \beta \leq 1$ is the bargaining power of workers to wage. Solution of equation (7) satisfies:

$$I^L - I^U = \frac{\beta}{1-\beta}(I^J - I^V) \tag{8}$$

Combine equation (2), (3), (6) and (8), we have:

$$w = \frac{\beta(r+\delta+p)}{r+\delta+\beta p - h(r+\delta)(1-\beta)} y \tag{9}$$

Therefore, the pre-tax wage is determined by a combination of productivity level, discount rate, income tax rate, workers' bargaining power, job destruction rate, and job-finding rate.

3.2 Possible channels

Equation (9) implies that firms' hiring cost w can be affected by LCL enforcement through the following channels:

i) tax rate increases and w increases

Before 2008, short term contracts and temporary hiring typically did not cover social security payment. The compliance of LCL requires compulsory social security participation for every employment; therefore, the payroll tax rate goes up. Equation (9) is an increasing function of tax rate h; if the workers regard the payroll tax as income tax, hiring cost w rises accordingly.

ii) job destruction rate decreases and w increases

Since the bargaining power $\beta < 1$ and tax rate $h < 1$, equation (9) is a decreasing function with respect to the job destruction rate δ.As Section 2.2 discussed, LCL raises both legal and financial severance costs. Therefore firms are more cautious in laying off workers, δ goes down (may be temporarily), and w goes up.

iii) bargaining power is assumed to be independent

Equation (9) is an increasing function with respect to beta. However, although EPL is supposed to enhance employees' bargaining power in litigation, there is no clear evidence that it would increase either individual or collective bargaining power on wage negotiation. The link between law and bargaining power is especially vague in China, which lacks strong trade unions and the intention of reform (Qi and Huang, 2016), and courts rule differently on the same legal issues (Cooney, 2009). Referring to the textbook of search-matching models (Pissarides, 2000, page 16) that assumes β merely depends on firms' and workers' relative patients on bargaining, in this paper I assume β is independent of LCL enforcement.

iv) job finding rate decreases, w increases in low-bargaining power sector and decreases in high-bargaining power sector

For the following reasons, the job-finding rate decreases with LCL enforcement: First, the rise of severance costs makes firms more cautious in hiring new

employees; second, the decreased job destruction rate slows down the employment turnover; third, added regulation enlarges market friction (for example, more administrative costs), which reduces job matching efficiency.

Differentiate the both side of equation (9) with respect to job destruction rate p, we have

$$\frac{\partial w}{\partial p} = \frac{(\beta - h)(r + \delta)(1 - \beta)}{[r + \delta + \beta p - h(r + \delta)(1 - \beta)]^2} y.$$

Since $(r + \delta)(1 - \beta)$ is bigger than zero definitely, the sign of $(\partial w / \partial p)$ depends on the sign of $(\beta - h)$, which means the direction of job-finding rate's impact to hiring cost depends on the relative size of bargaining power and income tax. This channel provides a theoretical ground that LCL has different impact on different sectors of the economy. In low-wage industries, workers' bargaining power is usually small; thereby $(\beta - h) < 0$, and w will be increased with p decreases. In high-wage industries, which are usually skill-specific and workers' bargaining power on wage is relatively high, $(\beta - h)$ is likely to be positive and w decreases with p decrease.

In summary, the model of wage determination suggests that LCL enforcement can increase hiring costs by increasing the payroll tax rate and decreasing the job destruction rate. Still, for sectors in which workers have higher bargaining power for wages, this impact will be offset with the drop in job-finding rate.

4 Identification Strategy and Data

4.1 Regression specifications

Based on equation (9), I estimate the following equation to examine the correlation of the hiring cost and LCL enforcement:

$$\Delta w_{it} = \zeta_1 D_t + \zeta_2 \Delta y_{it} + \upsilon_i + \mu_{it} \tag{10}$$

Here $\Delta w_{it} = w_{it} - w_{it-1}$, w_{it} is the logarithm of pre-tax wage of province i at year t; D_t is the dummy of LCL enforcement, ; $\Delta y_{it} = y_{it} - y_{it-1}$, y_{it} is the logarithm of GDP; υ_i is province-fixed effect; μ_{it} is the error term.

The data of dependent variable w_{it} is collected from the *China Labor Statistical Yearbook* (2003 – 2017). Here $i = 31$, which includes 31 provinces; and $t = 12$, which is from years 2003 – 2014. w_{it} is recorded by firms' ownership; there are three kinds of firms: State-owned, collectively-owned[4], and other ownership (which includes private, foreign or mixed ownership). As a socialist country, state-owned firms take about 20% of the labor input in China and collective firms take about 4% [5]; mixed-ownership firms also have state-owned and collective shareholders. Table 3 reports the statistical summary of provincial-average pre-tax wages, which shows that, on average, state-owned firms have the highest hiring cost; collective firms have much lower hiring costs than other types of firms. I also examine the impact of LCL at the industrial-level. Industries in China are coded into 19 categories. Figure 3 shows that the financial companies provide an eminent pre-tax salary.

The underlying theory of equation (10) is that in a developing economy, the growth of wages follows productivity growth, and after the year 2008, the pre-tax wage growth has been subject to LCL. I collected the independent variable

[3]By constitution, China has 34 provincial administrative regions; in the statistical yearbook, the data for Hong Kong, Macao and Taiwan is not reported. In my data set, the four municipalities of Beijing, Tianjin, Shanghai and Chongqing are regarded as provinces.

[4]Collectively-owned companies are socialist economic organizations whose property belongs to working collective masses(Regulations of the Urban Collective Ownership Enterprises of the People's Republic of China, `www.gov.cn/gongbao/content/2016/content_5139594.htm`). In urban areas, they usually belong to the labor union; in rural areas, they usually belong to the village council. The main feature of collective enterprises is that "property rights are vaguely defined, and there is significant involvement of government officials" (Tian, 2000, page 248). Along with economic reforms, the share of the collective sector in the whole economy is decreasing over the years; from 2003 to 2014, the labor input of collective firms to total labor force fell from 8 - 3%. But collective ownership is still crucial because the Chinese government does not recognize the private property of the land (private firms and individuals only have the right to use it), therefore technically, all the lands are either state- or collective-owned.

[5]Year 2010 data, National Bureau of Statistics.

y_{it} of each industry from each province's statistical or economics yearbook. In equation (9), y is the output per worker, but the industrial-level labor input is not consistent in the official database. The numbers of private sector employees from 2005 to 2010 are not reported. Therefore I use the growth of GDP instead of GDP per worker to represent the productivity growth. In terms of firms' ownership, respective levels of output are not reported. I assume there is a spillover effect within each industry, and that the growth rates of y_{it} are the same for different types of firms.

4.2 Instrumental variables

In the model of equation (9), the income tax rate, job destruction rate, job-finding rate, and workers' bargaining power to wage, are all affecting the wage level. The LCL enforcement dummy is very likely to be endogenous with these unobserved variables. Therefore I propose two instrumental variables to identify the impact of LCL.

4.2.1 Maternity insurance coverage

The Labor Law (1995) and LCL (2008) provide the legal basis of compulsory social security participation [6] . LCL is more binding because of the explicit terms of the standard contract. There are five kinds of mandatory social security insurance in China: Pension, medical, unemployment, injury, and maternity. The first four insurances are probably to be refunded in the future to every worker. Maternity insurance was mandatory for all Chinese workers, both men and women, between 2003 and 2014. It was compulsory for workers even without the intention or possibility, or not being allowed (under the one-child policy) to have another child, until their retirement. Therefore I use maternity insurance (MI) coverage as an instrument to resolve the potential endogeneity problem

[6]Social Security Law (2011) regulates the management and refund of social security funds; participation is not explicitly addressed.

[6]The one child policy was implemented in 1979, and has been changed to a two-child policy since 2011.

of the LCL dummy. Because first, MI participation is exclusively enforced by LCL, and it is unbiased with respect to gender, age, or type of work. Second, the rate of MI is 0.8%, which is much smaller than pension and medical insurance; therefore, it is a strict compliance of labor law, and its correlation with the wage bargaining process is limited.

4.2.2 Incidence of contract termination dispute

Employment lawsuit is another practice that associates with labor law and is not involved in wage negotiation. As Figure 2 shows, labor litigation is categorized into wage disputes, social security disputes, contract termination disputes, and others. Among the three major categories, wage disputes can be affected by Minimum Wage Provision (2004); and social security disputes mainly involve pension and medical insurance, which are related to local regulation. Contract termination disputes (CTD) are exclusively correlated with LCL, because the old and new labor laws are the only regulations which address the job dismissal procedure. For that reason, I employ the incidence of CTD as an additional instrument variable to MI participation, in the case that MI participation is endogenous to LCL (for example, in low-wage sectors, the MI payment is valuable to workers. CTD incidence itself is a weak instrument, as the first-stage F value is smaller than 10, and cannot be used alone.

The proposed two instrument variables together are valid in most cases of the 2SLS endogeneity tests of this study. But in the recent development of econometric theory, Young (2019) points out that if the i.i.d assumption of the residuals does not hold, the 95% confidence level of the Durbin-Wu-Hausman test cannot sufficiently reject the null hypothesis of endogeneity. In the model of wage determination, it is difficult to argue that the unobserved variables are independent to the regressors. There are also concerns that MI participation is associated with the income tax rate, and CTD incidence is not exogenous to the job destruction rate. Therefore, assuming the instrument variables are "plausibly exogenous", I adopt the Union of Confidence Interval (UCI) approach

from Conley et al. (2012) to justify the confidence interval of the impact.

5 Empirical Results

5.1 First-stage regression

Table 4 reports the statistical summary of the wage growth at the provincial-average level and the independent variables of first-stage regression. The growth of wages is slower than GDP growth, with a bigger standard deviation. Table 5 reports the first stage OLS by bootstrap (500 replications). The results show that both instrument variables are significantly correlated with the LCL enforcement dummy, and the F-values are significantly large.

For industrial-level data, 2SLS regression with bootstrap can not converge. Thereby the estimations are conducted by 2SLS with robust standard error. The first-stage results are not reported here for the sake of brevity. The following 2SLS estimation tables of example industries will show the F-value.

5.2 Provincial-average data

Table 6 reports the regression outcomes of equation (10) with provincial-average data. Except for other-ownership firms, 2SLS provide more consistent estimations than pooled OLS. The first three columns suggest that LCL does not have a significant impact on the average hiring cost of all firms. But the middle part of the table shows that LCL negatively associates with the pre-tax wage growth of state-owned firms, and positively contributes to collective firms. LCL likely has the same impact on small private companies as that on collective firms. However, the category of other-ownership broadly includes private-state-mixed ownership, foreign ownership, and joint venture, which are usually big companies. Therefore the estimation results for all firm average and other-ownership are both not significant.

The UCI approach further justifies these findings. The last row of Table 6 reports the upper and lower bounds of the target parameter ζ_1 when the instru-

ments are not strictly exogenous and correlated to the dependent variable with a non-zero coefficient γ. Following Conley et al. (2012), I run the UCI regression on Stata with command *plausexog*. The interval of γ is the approximation of the 95% confidence interval of γ in reduced-form estimation

$$\Delta w_{it} = \gamma I_{it} + \zeta_1 D_t + \zeta_2 \Delta y_{it} + \upsilon_i + \mu_{it}$$

where I_{it} is the vector of the instrument variable. Figure 4 to Figure 7 plot the upper and lower bound of ζ_1 against γ, in the case of a single instrument (MI participation rate). The results show that for state-owned firms, the LCL impact is almost negative definitely; for collective firms, only a small portion of the intervals are below zero.

5.3 Industrial-level data

I repeat the same empirical strategy as the previous section for each industry. Table 7 reports the estimation results of the manufacturing sector, which takes the most prominent share of labor input[7]. Here 2SLS estimations are all more consistent than the OLS estimation. The first three columns suggest that the impact is positive and significant at a 95% confidence level. And the last six columns indicate that for collective and other manufacturing companies, LCL enforcement elevates about 4% of their hiring cost growth at a 99% confidence level. Figure **??** – 11 show that by the UCI approach, if the instruments are not entirely exogenous, the 95% confidence interval of the impact is still almost above zero on all kinds of manufacturing firms, except for state-owned firms.

Table 8 reports regression results of the finance industry, the industry which has the highest hiring cost. Here 2SLS with MI coverage as a single instrument provides a valid and consistent estimation. The $2SLS_1$ columns imply that, except for collective firms, LCL decreases the pre-tax wage growth of all financial companies by 7 - 8%. Figure 12 – 15 enhance this inference by the UCL

[7]Manufacturing sector accounts for over 25% of urban employment; 8% of manufacturing jobs are state-owned. Year 2014 data, resource: National Statistical Bureau database.

approach: the 95% confidence intervals are all below zero, which means the impact is definitely negative.

Manufacturing and finance are typical low-wage and high-wage sectors. The findings above are consistent with the Section 3.2 theory, that LCL has a different impact on jobs with different workers' bargaining powers. Table 9 lists the 2SLS estimation [8] results of LCL impact on each of the 19 industries and each type of firm. At the 95% confidence level, LCL positively contributes to the hiring cost growth of manufacturing and wholesaleretail business, which are both low-salary departments (Figure 3), and take one-third of urban employment together[9]. LCL also lowers the hiring cost growth of electricity, transportation, finance, research, education, and public administration sectors, which are all dominated by state-owned companies or organizations.

In summary, the empirical results of this section show that LCL enforcement significantly increases the pre-tax wage in the manufacturing industry, but decreases the salary of high-wage and typical state-owned sectors. The manufacturing firms provide more than 25% of urban employment, which explains the mainstream criticism of LCL increasing firms' hiring costs.

6 Robustness Check

6.1 Alternative independent variable

In this subsection, I replace the y_{it} of equation (10) with alternative data to check the robustness of previous findings with provincial-average hiring cost. Here y_{it} is GDP per worker, calculated as GDP divided by the number of total

[8] All estimations are run with two instrument variables first; if the null hypothesis of the regression is rejected by the endogeneity test, then I run the 2SLS with one instrument.

[9] Resource: National Statistical Bureau database.

[9] In electricity, transportation, finance, and research sectors, 25 - 30% of urban employment is state-owned; in education and public administration sectors, over 90% of the jobs are from state-owned institutions. In comparison, in manufacturing and retail business, state-owned firms provide less than 10% of employment. 2014 data, resource: National Statistical Bureau database.

labor input; the data is from the *China Labor Statistical Year Book* (at the industrial-level, labor input from 2005 to 2010 has not been reported). Table 10 reports the estimation results by firms' ownership. For all firms on average and other-ownership companies, the estimated impact of LCL is not yet significant. The second three columns also come to the same conclusion as Table 6 that at 99.9% confidence level, LCL causes a rounding 3% drop of state-owned enterprises' hiring cost growth. For collective firms, the value of the LCL dummy coefficient is smaller than the Table 6 result but still significant at a 90% confidence level.

Figure 16 – 19 sketch the 95% confidence intervals of the target coefficient by the UCI approach. Figure 17 is the same as Figure 5, which shows that the LCL impact is almost definitely negative on state-owned firms. Figure 18 is slightly different from Figure 6 because the lower bound of the intervals is below zero here. But the main part of the confidence intervals is still above zero, which suggests LCL is likely to have a positive impact on collective firms' hiring cost growth.

6.2 Counterfactual prediction

This subsection provides a simple counterfactual analysis by predicting the hiring costs without LCL enforcement. I estimate the following equation with panel data from 2003 to 2007:

$$w_{it} = \zeta_0 w_{it-1} + \zeta_1 (y_{it}, y_{it-1})' + \zeta_3 r_t + \upsilon_i + \mu_{it}, \tag{11}$$

then use the estimated coefficient to predict the dependent variable from 2008 to 2014. Here w_{it} is the logarithm of the pre-tax wage of province i at year t, y_{it} is the logarithm of GDP, which are both the same as Section 5. r_t is the one-year lending interest rate of Chinese Yuan; the resource is the World Bank database.

Taking Beijing (the capital city) and Guangdong (the province with the highest GDP) as an example, Figure 20 – 25 compare the growth path of their real hiring cost and the counterfactual prediction. For the pre-tax salaries of the

all-firm-average, the real numbers are close to the upper bound of the counterfactual 95% confidence interval. In Figure 22 and Figure 23, real pre-tax wage is clearly above the counterfactual prediction, which implies that LCL significantly increases the hiring cost of the manufacturing industry in these two economic centers. For the financial sector, the real hiring costs are slightly lower but lie in the 95% confidence interval of counterfactual prediction.

Figure 26 – **??** depict the box plots of real and counterfactual hiring costs by year. Figure 26 shows that for all firms on average, the real pre-tax wage is a bit higher than the predictions without LCL enforcement. Figure 27 and 28 indicate that hiring costs were remarkably increased in manufacturing and decreased in the financial industry by LCL. For state-owned enterprises, Figure 32 – 34 show that LCL cuts the average pre-tax salary and the wages in the financial sector over the years. And for collective firms, Figure **??** suggests the manufacturing business is the one most severely affected by LCL. For companies with other ownership, the wage data is not serially correlated, thereby the equation (11) prediction can not converge.

In summary, the robustness checks confirm that LCL does not have a significant impact on average pre-tax wages but decreases the salaries in high-wage sectors. For low-wage sectors like manufacturing, hiring costs can be much lower without LCL enforcement.

7 Further Discussion

This paper explains the impact of Labor Contract Law on firm's hiring cost by both theory and data. The theory proposes that LCL can have opposing influences on different sectors, which depends on the relative value of workers' bargaining power and the income tax rate. Intuitively, highly-educated or skilled workers would have higher bargaining power, and LCL decreases their pre-tax wage; workers in labor-intensive sectors usually have low bargaining power, and LCL will increase the hiring cost.

The empirical part finds that the downward impact happens broadly in

state-owned sectors. In theory, two channels could raise the hiring cost, and one channel cloud bring it down, which means the three channels can offset each other. However, in practice, only the downward channel likely works at state-owned firms. First, state-owned firms have long been mandated to contribute to the social security funds (Fan and Hope, 2012), which are also operated by the government. Therefore LCL does not cause income tax hikes in state-owned sectors, and in equation (9), h does not change. Second, state-owned companies are discouraged from dismissing workers, as employment creation is one of their priorities[10](Lin et al., 2020). Hence in equation (9), δ is close to zero, and the job destruction channel does not apply to state-owned firms. Furthermore, employees in state-owned firms usually have local "Hukou" (household registration)[11]. Therefore they can fully benefit from social security payments. In this scenario, workers regard payroll tax as income rather than income tax, h in equation (9) is much lower than other sectors, and $\beta - h$ is positive. Finally, LCL decreases the market job finding rate p, and hiring cost decreases accordingly.

On the other hand, in the typical low-wage and labor-intensive manufacturing industry, the majority of employmees are unskilled migrant workers. They do not have local "Hukou" and cannot fully enjoy the social security benefit, especially the pension. Therefore, LCL substantially raises h and increases manufacturing firms' hiring costs through both the income tax channel and the job-finding rate channel. An inevitable question here will be whether workers benefited from the rise of pre-tax wages? Combining equations (3) and (9), the utility of employment is given by

$$I^L = \frac{\beta(r+p)(1-h)}{r[r+\delta+\beta p - h(r+\delta)(1-\beta)]} y.$$

In the case of the escalation of h and a drop of p, I^L will increase only if there is a massive decline of job destruction rate δ. But in the manufacturing sector, except for state-owned firms, employment relationships are usually bound by

[10]Massive layoffs in SOEs only happened during the privatization of the manufacturing industry between the late 1990s and early 2000s.

[11]In State-owned firms, either "Hukou" is a recruitment condition, or the company has the quota to provide "Hukou" to new employees.

short-term contracts. Therefore LCL can not have a significant influence on the job destruction rate. As a result, the growth of I^L is left behind the productivity growth.

In conclusion, I find that LCL significantly holds back the hiring cost growth of industries that are dominated by state-owned firms, and it positively contributes to the pre-tax wage growth in the manufacturing sector. However, as an EPL, LCL decreases workers' benefits in general. Because in high-wage industries, the remuneration level goes down; and in low-wage sectors, the hike of payroll tax takes away the incremental hiring cost.

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Tables and Figures

	permanent employment	individual dismissal	collective dismissal	temporary employment
China 2012	3.01	3.31	2.25	1.88
OECD average	2.27	2.03	2.89	2.07
world average	2.18	2.15	2.26	2.24

Resource: http://www.oecd.org/els/emp/oecdindicatorsofemploymentprotection.htm

Table 1: OECD EPL index

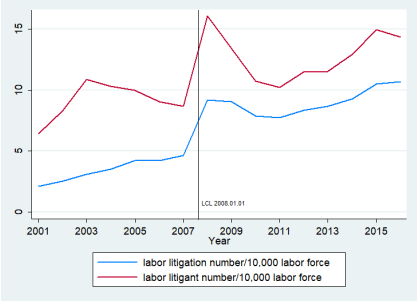

Figure 1: Incident rate of labor litigation

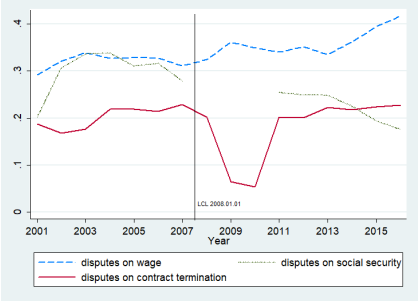

Figure 2: Share of contract termination dispute

[11] Data resource of Figure 1 to 4: *China Labor Statistical Yearbook* 2017. All observations are year-end aggregated number, therefore I put the benchmark of LCL enforcement at the middle of 2007 and 2008. For Figure 3, data of social security disputes is not reported by data resource.

EPL	Mandatory Terms of an Employment Contract
Labor Law 1995	(1) contract period; (2) working contents; (3) working conditions and protection; (4) remuneration; (5) working disciplines; (6) conditions of contract termination; (7) responsibilities of contract breach.
Labor Contract Law 2008	(1) employer's name, address and legal representative; (2) employee's name, address and identification number; (3) contract period; (4) working contents and workplace; (5) working hours, rest and leave; (6) remuneration; (7) social insurance; (8) working conditions, occupational hazards protection; (9) other matters required by labor law and regulations.

Labor Law 1995 resource: http://www.gov.cn/banshi/2005-05/25/content$_9$05.*htm*

LCL 2008 resource: http://www.gov.cn/flfg/2007-06/29/content$_6$69394.*htm*

Table 2: Mandatory terms of an employment contract by labor law

firm type		Mean	Std. Dev	Min	Max	Obs
all	overall	31844.6	16149.9	10378.1	102268	N =372
	between		8441.7	24852.2	58972.1	n = 31
	within		13844.5	-2123.6	75140.5	T = 12
state firm	overall	34483.4	17898.3	10226	102538	N = 372
	between		10128.4	24715.9	61952.5	n = 31
	within		14859.5	-1301.2	75847.3	T = 12
collect firm	overall	22521.4	12647.5	5446	60008	N = 372
	between		4792.1	15379.4	35985.8	n = 31
	within		11733.6	1708.6	53473.6	T = 12
other firm	overall	30182.5	16045.3	8691	104146	N = 372
	between		8358.3	22877.8	59416.7	n = 31
	within		13771.8	-5089.2	74911.8	T = 12
manufacture	overall	27832.7	13879.9	8907	80418	N = 372
	between		5716.2	22589.2	47701	n = 31
	within		12686.4	3646.5	63635.5	T = 12
finance	overall	54513.2	35775.6	12667.5	225482	N = 372
	between		23260.4	30648.3	132782.4	n = 31
	within		27475.3	-33260.3	147212.8	T = 12

Unit of wage: yuan per year

Data resource: China Labour Statistical Yearbooks

Table 3: Statistical Summary of Pre-tax Wage by Firms' Ownership

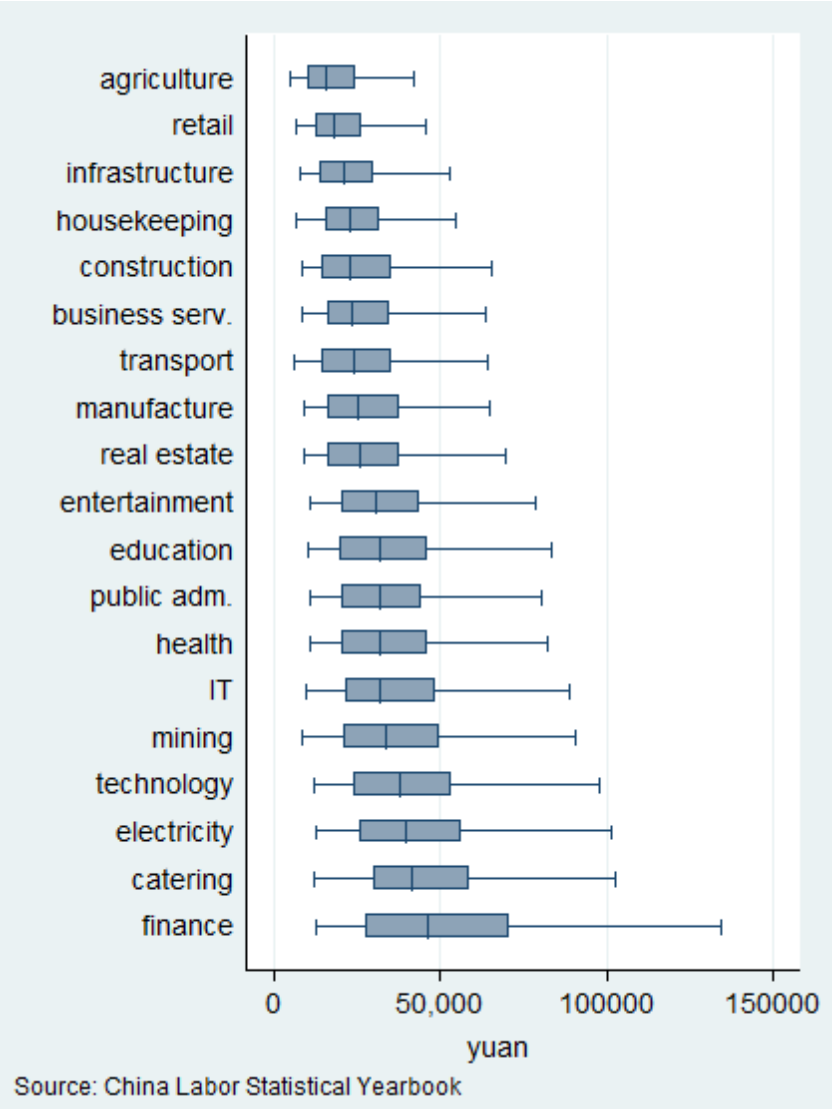

Figure 3: Province-level hiring cost of each industry, year 2003 to 2014

		Mean	Std. Dev	Min	Max	Obs
$\Delta wage$	overall	.124	.081	-.376	.508	N =341
	between		.028	.005	.158	n = 31
	within		.076	-.257	.534	T = 11
ΔGDP	overall	.149	.052	-.011	.280	N =341
	between		.015	.114	.182	n = 31
	within		.050	-.013	.254	T = 11
MI coverage	overall	.157	.134	.001	.792	N = 335
	between		.120	.051	.593	n = 31
	within		.063	-.044	.490	T-bar = 10.8065
CTD incidence	overall	1.158	2.172	.006	18.46	N = 341
	between		1.660	.136	8.758	n = 31
	within		1.428	-6.362	10.86	T = 11

CTD incidence: number of contract termination dispute per 10,000 worker.

Data resource: China Labour Statistical Yearbooks, database of National Statistics Bureau

Table 4: Statistic Summary of First-Stage Regressors (province-average)

D	OLS	OLS
MI coverage	4.048 (.660)	4.056 (.670)
CTD incidence		.043 (.017)
ΔGDP	-1.430 (.487)	-1.226 (.505)
Obs	335	335
F	118.514	64.6578

With province-fixed effect, bootstrap, reps (500).

Standard errors in parentheses.

Table 5: First Stage Regression of LCL Dummy and IVs (province-level)

$\Delta wage$	all firms			state-owned			collective-owned			other ownership		
	OLS	$2SLS_1$	$2SLS_2$	OLS	$2SLS_1$	$2SLS_2$	OLS	$2SLS_1$	$2SLS_2$	OLS	$2SLS_1$	$2SLS_2$
D_{LCL}	.007	.031	.027	-.024***	-.024***	-.026***	.017*	.038**	.032*	.014	.003	.004
	(.009)	(.017)	(.016)	(.005)	(.007)	(.007)	(.008)	(.016)	(.015)	(.018)	(.010)	(.010)
ΔGDP	.356**	.450***	.436***	.348***	.348***	.343***	.425***	.516***	.495***	.440***	.328***	.334***
	(.083)	(.104)	(.104)	(.040)	(.045)	(.044)	(.083)	(.105)	(.104)	(.111)	(.075)	(.070)
obs	341	335	335	341	335	335	341	335	335	341	335	335
R^2	0.1580	0.1330	0.1385	0.3649	0.3604	0.3605	0.1476	0.1279	0.1374	0.0522	0.1608	0.1616
province FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Instrument		MI	MI, CTD		MI	MI, CTD		MI	MI, CTD		MI	MI, CTD
first stage F		48.9874	64.6578		48.9874	64.6578		48.9874	64.6578		48.9874	64.6578
endogenous chi2		0.0602	0.1184		0.8430	0.9641		0.0437	0.1300		0.5814	0.7202
endogenous F		0.0741	0.1360		0.8516	0.9660		0.0666	0.1599		0.5967	0.7326
over-id			0.2666			0.4554			0.0443			0.5059
Hausman		0.2591	0.3104		0.5806	0.5835		0.1779	0.1395		0.0000	0.0000
UCI		(-.05, .09)	(-.07, .10)		(-.09, .02)	(-.11, .03)		(-.04, .09)	(-.06, .10)		(-.07, .05)	(-.08, .06)

Standard errors in parentheses, bootstrap reps(500);* p<0.05, ** p<0.01, *** p<0.001.

In row Instrument, MI means maternity insurance coverage; CTD means incidence rate of contract termination disputes.

P-value in endogeneity, over-identification and Hausman tests.

Row *Hausman* reports Hausman tests of 2SLS against OLS.

Row UCI is union of confidence interval approach from Conley et.al. (2012), 95% confidence level, vce robust;

in $2SLS_1$ columns, $\gamma_min = -0.1$, $\gamma_max = 0.2$;in $2SLS_2$ columns, $\gamma_min = (-0.1, -0.01)$, $\gamma_max = (0.2, 0.01)$;

Table 6: OLS and 2SLS estimations with provincial-average data

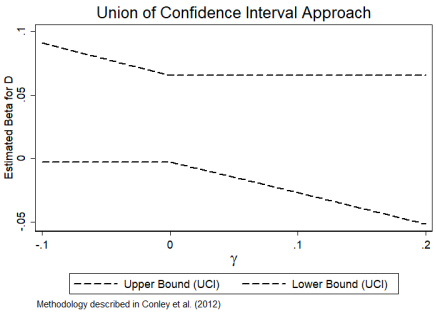

Figure 4: UCI of all firms

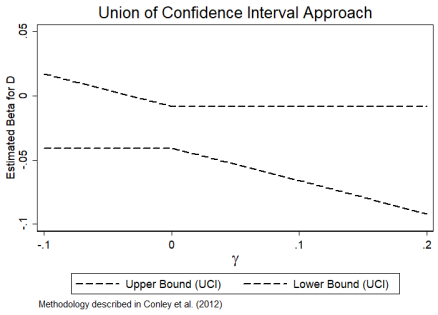

Figure 5: UCI of state-owned firms

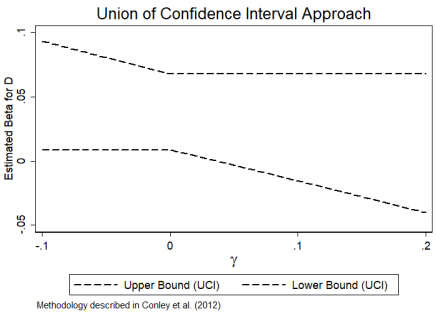

Figure 6: UCI of collective firms

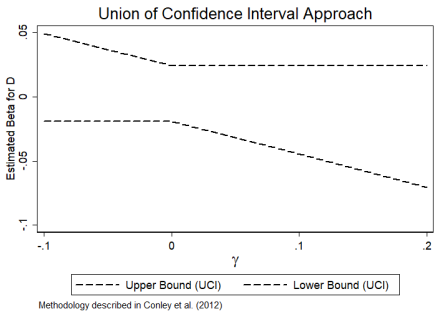

Figure 7: UCI of other firms

[11] Figure 4 to Figure 7 show the confidence intervals by UCI approach; γ is the plausible coefficient of instrument variable (maternity insurance coverage).

$\Delta wage$	all firms			state-owned			collective-owned			other ownership		
	OLS	$2SLS_1$	$2SLS_2$	OLS	$2SLS_1$	$2SLS_2$	OLS	$2SLS_1$	$2SLS_2$	OLS	$2SLS_1$	$2SLS_2$
D_{LCL}	.010	.016	.016*	-.019*	-.019	-.023	.032**	.043**	.042**	.027***	.038***	.039***
	(.005)	(.008)	(.008)	(.010)	(.017)	(.017)	(.012)	(.015)	(.016)	(.007)	(.009)	(.009)
ΔGDP	.188***	.202***	.204***	.122	.125	.118	.240***	.260***	.257**	.227***	.251***	.253***
	(.031)	(.035)	(.035)	(.073)	(.078)	(.079)	(.065)	(.069)	(.069)	(.041)	(.046)	(.046)
obs	330	324	324	330	324	324	330	324	324	330	324	324
R^2	0.1873	0.1830	0.1819	0.0579	0.0569	0.0568	0.0877	0.0841	0.0848	0.1561	0.1453	0.1440
province FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Instrument		MI	MI, CTD		MI	MI, CTD		MI	MI, CTD		MI	MI, CTD
first stage F		51.006	29.6695		51.006	29.6695		51.006	29.6695		51.006	29.6695
endogenous chi2		0.1977	0.1563		0.9275	0.8901		0.3570	0.4343		0.1042	0.0775
endogenous F		0.2437	0.1984		0.9314	0.8958		0.3931	0.4651		0.1533	0.1193
over-id			0.7185			0.3660			0.7574			0.6094
Hausman		0.1652	0.1516		0.9971	0.9971		0.1234	0.1261		0.5291	0.4922
UCI		(-.03, .06)	(-.04, .08)		(-.09, .05)	(-.11, .06)		(-.03, .11)	(-.04, .12)		(-.01, .09)	(-.03, .10)

Standard errors in parentheses, robust;* p<0.05, ** p<0.01, *** p<0.001.

In row Instrument, MI means maternity insurance coverage; CTD means incidence rate of contract termination disputes.

P-value in endogeneity, over-identification and Hausman tests.

Row *Hausman* reports Hausman tests of 2SLS against OLS.

Row UCI is union of confidence interval approach from Conley et.al. (2012), 95% confidence level, vce robust;

in $2SLS_1$ columns, $\gamma_min = -0.1$, $\gamma_max = 0.1$;in $2SLS_2$ columns, $\gamma_min = (-0.1, -0.01)$, $\gamma_max = (0.1, 0.01)$;

Table 7: OLS and 2SLS estimation with manufacturing industry data

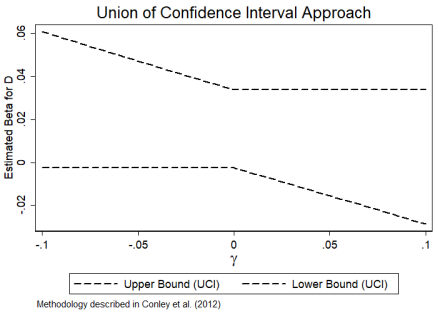

Figure 8: UCI of all manufacturing firms

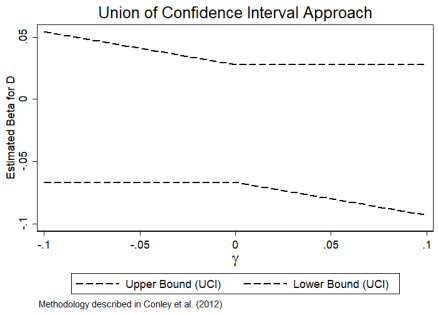

Figure 9: UCI of state-owned manufacturing firms

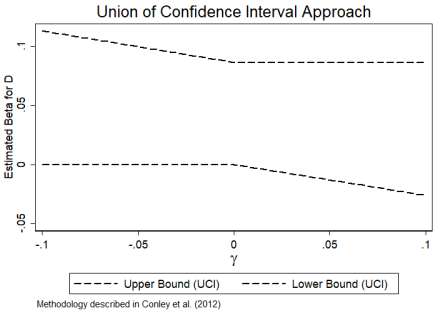

Figure 10: UCI of collective manufacturing firms

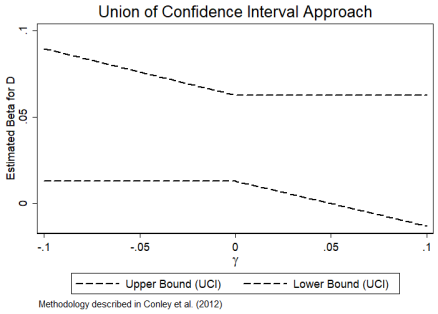

Figure 11: UCI of other manufacturing firms

[11] Figure 8 to Figure 11 show the confidence intervals by UCI approach; γ is the plausible coefficient of instrument variable (maternity insurance coverage).

$\Delta wage$	all firms			state-owned			collective-owned			other ownership		
	OLS	$2SLS_1$	$2SLS_2$	OLS	$2SLS_1$	$2SLS_2$	OLS	$2SLS_1$	$2SLS_2$	OLS	$2SLS_1$	$2SLS_2$
D_{LCL}	-.049***	-.070***	-.074***	-.061***	-.079***	-.091***	-.040*	-.092	-.116*	-.043**	-.071***	-.071***
	(.007)	(.011)	(.010)	(.010)	(.019)	(.019)	(.018)	(.059)	(.059)	(.015)	(.020)	(.019)
ΔGDP	.065*	.065*	.065*	.105**	.106**	.106**	.060	.068	.067	.011	.010	.010
	(.027)	(.026)	(.06)	(.037)	(.034)	(.034)	(.080)	(.079)	(.81)	(.058)	(.056)	(.056)
obs	294	291	291	294	291	291	286	283	283	294	291	291
R^2	0.2114	0.1842	0.1733	0.1490	0.1330	0.1159	0.0766	0.0820	0.0712	0.0746	0.0629	0.0628
province FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Instrument		MI	MI, CTD		MI	MI, CTD		MI	MI, CTD		MI	MI, CTD
first stage F		57.2732	35.8698		57.2732	35.8698		75.654	41.5987		57.2732	35.8698
endogenous chi2		0.0395	0.0076		0.2429	0.0488		0.2671	0.1175		0.0868	0.0656
endogenous F		0.0404	0.0076		0.2617	0.0585		0.2405	0.0885		0.0901	0.0683
over-id			0.2733			0.0344			0.1014			0.9832
Hausman		0.0860	0.0304		0.0469	0.0300		0.1441	0.0641		0.2320	0.2117
UCI		(-.12, .00)	(-.14, .01)		(-.14, .00)	(-.17, .00)		(-.21, .05)	(-.25, .03)		(-.14, .02)	(-.15, .03)

Standard errors in parentheses, robust;* p<0.05, ** p<0.01, *** p<0.001.

In row Instrument, MI means maternity insurance coverage; CTD means incidence rate of contract termination disputes.

P-value in endogeneity, over-identification and Hausman tests.

Row *Hausman* reports Hausman tests of 2SLS against OLS.

Row UCI is union of confidence interval approach from Conley et.al. (2012), 95% confidence level, vce robust;

in $2SLS_1$ columns, $\gamma_min = -0.2$, $\gamma_max = 0.1$;in $2SLS_2$ columns, $\gamma_min = (-0.2, -0.01)$, $\gamma_max = (0.1, 0.01)$;

Table 8: OLS and 2SLS estimation with financial industry data

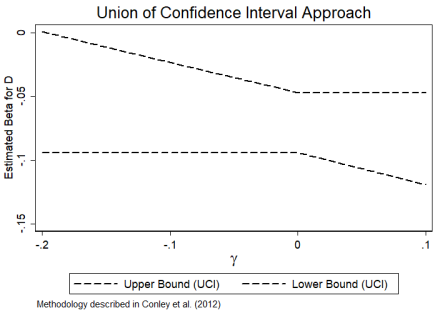

Figure 12: UCI of all financial firms

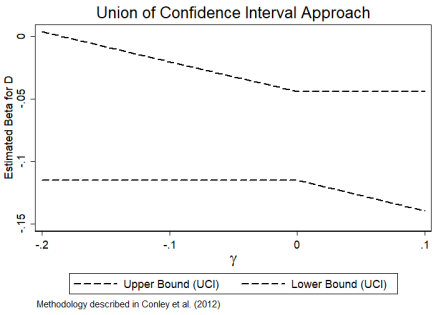

Figure 13: UCI of state-owned financial firms

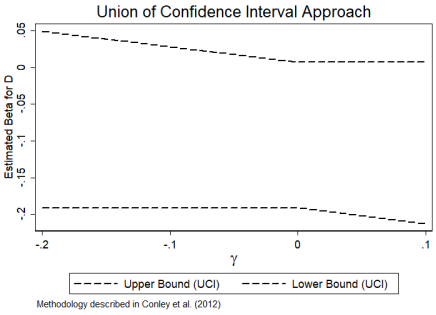

Figure 14: UCI of collective financial firms

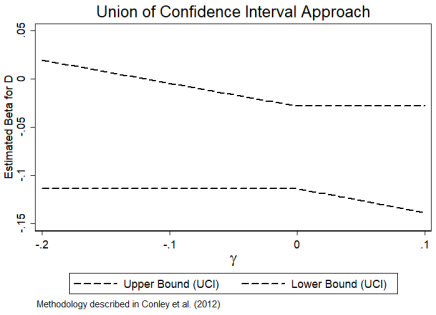

Figure 15: UCI of other financial firms

[11] Figure 12 to Figure 15 show the confidence intervals by UCI approach; γ is the plausible coefficient of instrument variable (maternity insurance coverage).

Industry	all firms	state-owned	collective	others
agriculture	.003	.002	.075	-.002
	(.012)	(.015)	(.136)	(.116)
mining	-.054	-.087	.099	.030
	(.045)	(.110)	(.187)	(.141)
manufacturing	.016*	-.023	.042**	.039***
	(.008)	(.017)	(.016)	(.009)
electricity, gas, water	-.033**	-.040*	-.006	-.043
	(.010)	(.020)	(.122)	(.116)
construction	-.007	-.038**	.022	.011
	(.010)	(.014)	(.021)	(.016)
transport, warehouse, postal	-.029**	.001	.124	-.040
	(.010)	(.024)	(.155)	(.123)
IT, software	-.039	-.054	.102	-.022
	(.022)	(.031)	(.132)	(.075)
wholesale and retail	.030*	-.089***	.112	-.105
	(.015)	(.017)	(.170)	(.121)
accommodation, catering	.008	.240*	.146	-.024
	(.023)	(.099)	(.245)	(.344)
finance	-.070***	-.079***	-.116*	-.071***
	(.011)	(.019)	(.067)	(.019)
real estate	.015	-.006	.066	-.044
	(.011)	(.019)	(.143)	(.127)
leasing, business services	-.034	-.053	.083	.073
	(.032)	(.034)	(.195)	(.179)
research, technology	-.044*	-.052**	.202	.005
	(.018)	(.018)	(.284)	(.197)
environment,infrastructural	-.009	-.013	.069	-.021
	(.012)	(.013)	(.168)	(.186)
household, other services	-.079*	-.040	.080	.084
	(.035)	(.031)	(.219)	(.175)
education	-.065***	-.065***	-.040	-.021
	(.013)	(.013)	(.041)	(.025)
health, social welfare	-.005	-.002	.106	.071
	(.012)	(.012)	(.225)	(.180)
culture, sports, entertainment	-.031	-.030	.145	-.050
	(.017)	(.018)	(.266)	(.247)
public administration	-.067***	-.073***	-.003	.074
	(.015)	(.014)	(.208)	(.200)

Standard errors in parentheses;* p<0.05, ** p<0.01, *** p<0.001

Most of the results are with two instrument variables;

some are with one instrument if the case of two is not valid.

Table 9: LCL impact on each industry by 2SLS estimation

$\Delta wage$	all firms			state-owned			collective-owned			other ownership		
	OLS	$2SLS_1$	$2SLS_2$	OLS	$2SLS_1$	$2SLS_2$	OLS	$2SLS_1$	$2SLS_2$	OLS	$2SLS_1$	$2SLS_2$
D_{LCL}	.003	.019	.015	-.029***	-.033***	-.034***	.012	.025	.020	.009	.-006	-.004
	(.009)	(.016)	(.016)	(.006)	(.007)	(.007)	(.009)	(.015)	(.014)	(.016)	(.010)	(.009)
Δproductivity	.257**	.291**	.281**	.248***	.245***	.242***	.329***	.345***	.346***	.331**	.225***	.230***
	(.086)	(.101)	(.096)	(.049)	(.055)	(.053)	(.084)	(.101)	(.102)	(.091)	(.070)	(.064)
obs	341	335	335	341	335	335	341	335	335	341	335	335
R^2	0.1431	0.1222	0.1256	0.3183	0.3177	0.3167	0.1271	0.1093	0.1145	0.0411	0.1236	0.1255
province FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Instrument		MI	MI, CTD		MI	MI, CTD		MI	MI, CTD		MI	MI, CTD
first stage F		131.182	71.1629		131.182	71.1629		131.182	71.1629		131.182	71.1629
endogenous chi2		0.1660	0.2714		0.4835	0.3479		0.1630	0.3687		0.2483	0.3083
endogenous F		0.1899	0.2950		0.5023	0.3681		0.2004	0.4010		0.2588	0.3239
over-id			0.2817			0.5253			0.0527			0.5397
Hausman		0.5866	0.6456		0.2753	0.2577		0.4236	0.5105		0.0000	0.0000
UCI		(-.04, .08)	(-.05, .08)		(-.07, .01)	(-.09, .02)		(-.03, .08)	(-.04, .08)		(-.05, .04)	(-.06, .05)

Standard errors in parentheses, bootstrap reps(500);* p<0.05, ** p<0.01, *** p<0.001.

In row Instrument, MI means maternity insurance coverage; CTD means incidence rate of contract termination disputes.

P-value in endogeneity, over-identification and Hausman tests.

Row *Hausman* reports Hausman tests of 2SLS against OLS.

Row UCI is union of confidence interval approach from Conley et.al. (2012), 95% confidence level, vce robust;

in $2SLS_1$ columns, $\gamma_min = -0.1$, $\gamma_max = 0.1$;in $2SLS_2$ columns, $\gamma_min = (-0.1, -0.01)$, $\gamma_max = (0.1, 0.01)$;

Table 10: (Robustness) OLS and 2SLS estimations with provincial-level data

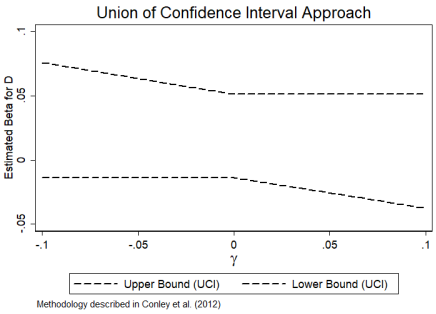

Figure 16: UCI of all firms

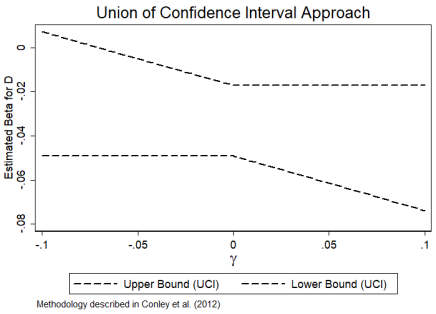

Figure 17: UCI of state-owned firms

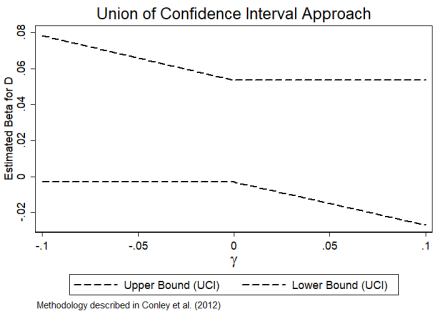

Figure 18: UCI of collective firms

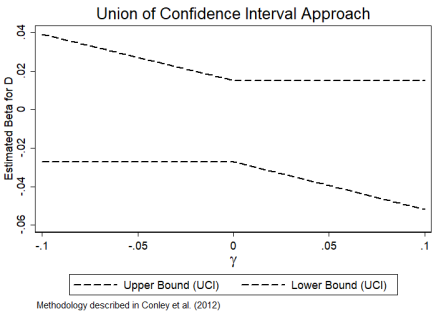

Figure 19: UCI of other firms

[11] Figure 16 to Figure 19 show the confidence intervals by UCI approach in robustness check; γ is the plausible coefficient of instrument variable (maternity insurance coverage).

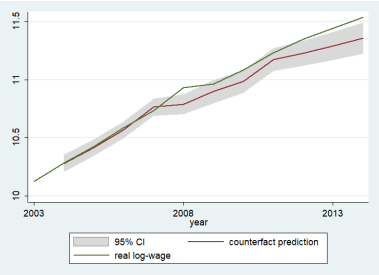

Figure 20: Beijing average wage

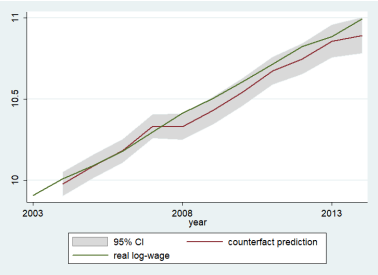

Figure 21: Guangdong average wage

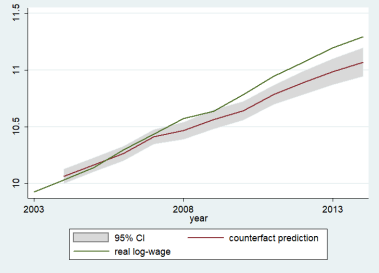

Figure 22: Beijing manufacture wage

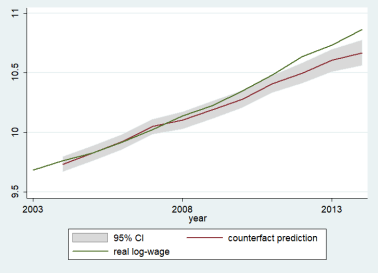

Figure 23: Guangdong manufacture wage

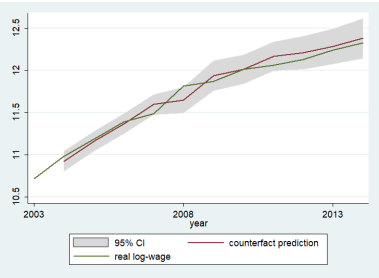

Figure 24: Beijing finance wage

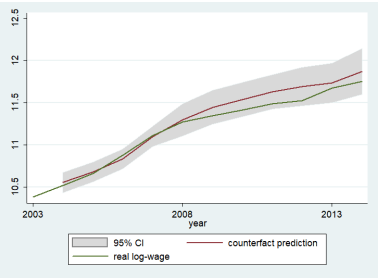

Figure 25: Guangdong finance wage

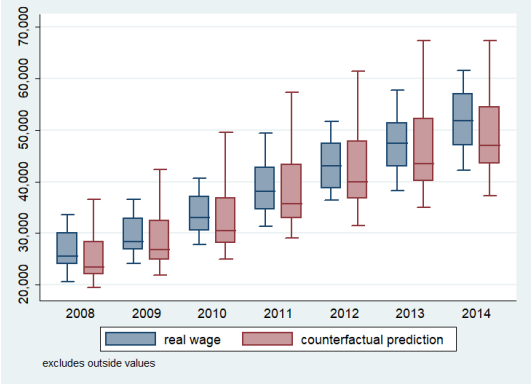

Figure 26: Real and Counterfactual hiring cost of all firms

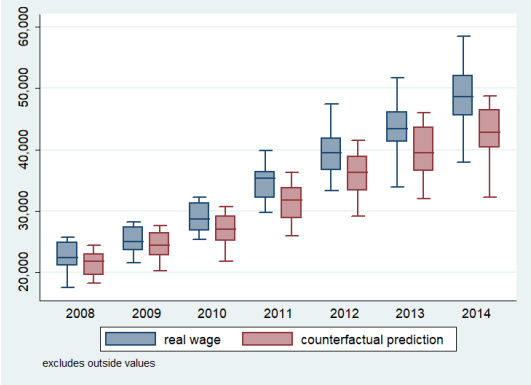

Figure 27: Real and Counterfactual hiring cost of manufacturing industry

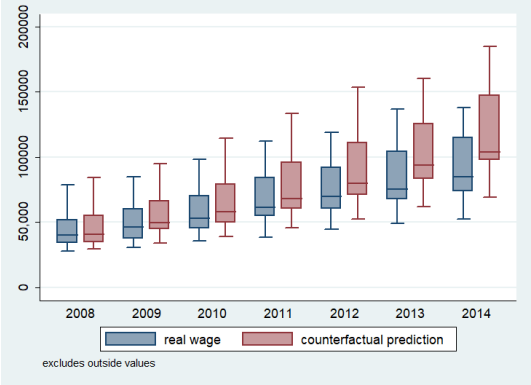

Figure 28: Real and Counterfactual hiring cost of financial industry

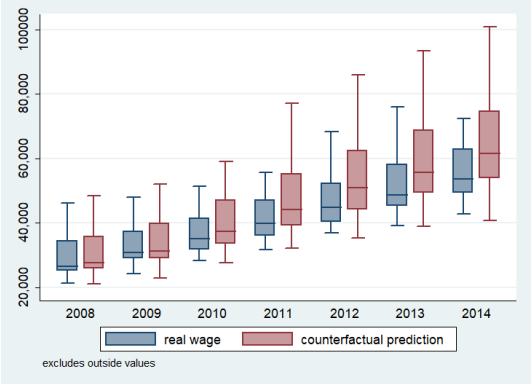

Figure 29: Real and Counterfactual hiring cost of all state-owned firms

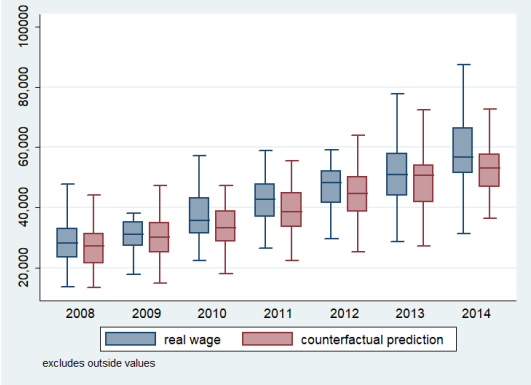

Figure 30: Real and Counterfactual hiring cost of manufacturing SoEs

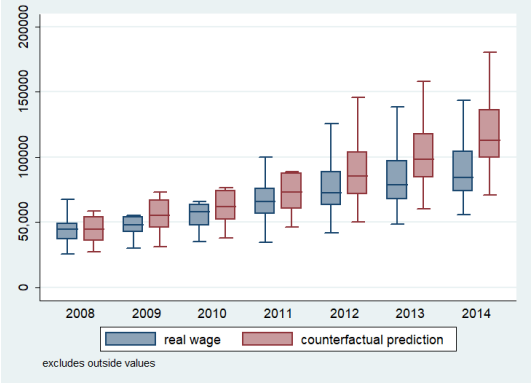

Figure 31: Real and Counterfactual hiring cost of financial SoEs

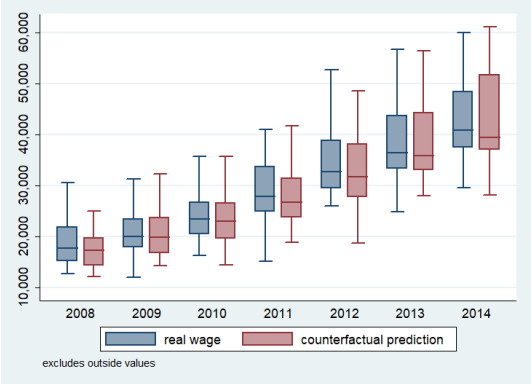

Figure 32: Real and Counterfactual hiring cost of all collective-owned firms

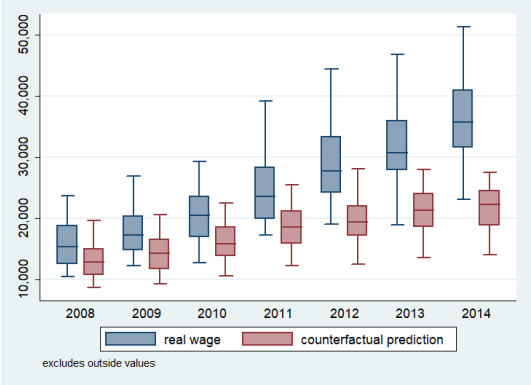

Figure 33: Real and Counterfactual wages of collective manufacturing firms

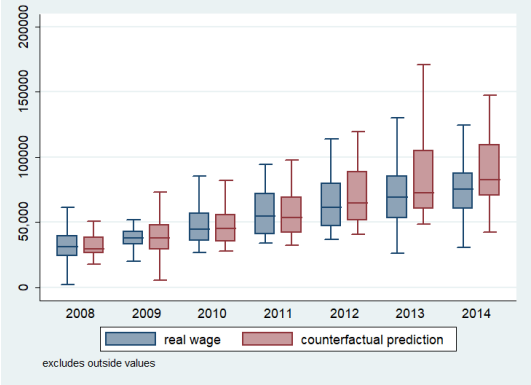

Figure 34: Real and Counterfactual hiring cost of collective financial firms