Effect of Public Sector and State-Owned-Enterprises on Wage Inequality in Urban China, 1988–2007

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Abstract: This paper examines the effect of the public sector and State-Owned-Enterprises (SOEs) on wage inequality in urban China using CHIP data. It applies quantile regressions, the Machado and Mata (2005) decomposition and an extension of their decomposition to investigate how urban wage inequality was affected by the changes in wage structure and employment shares of the public sector and SOEs. The econometric results show that the sharp fall of employment share of the SOEs, which was caused by the radical SOE reform in the second half of the 1990s, resulted in decreases of urban wage inequality for the periods from 1995 to 2002 and 2002 to 2007; however, the rise in the wage premium of the state sector versus nonstate sector before and after the SOE reform led to increases in urban wage inequality for the periods from 1988 to 1995 and 2002 to 2007.

Key words: China, public sector, SOEs, urban wage inequality, wage gaps, quantile regression, counterfactual analysis.

1. Introduction

Since the economic reform initiated in the late 1970s, the determinants of wages and the scale of the state-owned sector have been transformed enormously. On one hand, the pay scheme of the state sector especially the SOE sector has been becoming much marketized. On the other, the radical reform of the SOE sector in the second half of 1990s resulted in sharp fall of the number and employment share of the SOEs. However, the SOEs still dominate the key economic sectors, such as finance, insurance, telecommunication, railway, oil, electricity, aviation and so on. In addition, the Chinese SOEs are also able to get favorable treatment from the government and state-owned banks (such as easy credit, lower taxes, right to control scarce resources), set monopolistic prices, seize monopolistic profit and pay their workers wages that

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are higher than their marginal product of labor or market clearing prices. Consequently, industrial wage gaps, in particular those between the state-owned monopolistic sector and the nonstate sector, have been increasing. For example, the ratio of the average wage of the highest paid industry to that of the lowest paid increased from 1.76 in 1990 to 4.88 in 2005; the annual growth rates of the average wage of the state-owned, collective and other sectors were 15.3%, 13.5% and 12.9%, respectively, in the same period; furthermore, the annual growth rates of the average wage of the financial and insurance, postal and telecom, and gas and electricity sectors were 20.2%, 17.0% and 16.4%, respectively, and hence much higher than in other industrial sectors (SCDR, 2007). Based on the listed firm data for the period from 1999 to 2009, Lu *et al.* (2012) found out that the wages are higher in the SOEs controlled by the central government than in those owned by the local governments, and the local SOEs pay more than other nonstate enterprises. Up on these findings, we might enquire how the wage inequality in urban China has been affected by the changes in the pay scheme and employment share of the state sector especially the SOEs.

To this end, we formally decomposes changes in earnings inequality according to the method of Machado and Mata (2005) using the results of quantile analysis of wage differentials in 1988, 1995, 2002 and 2007. This technique attributes changes in inequality into two broad sources. The first changes in the wage structure – the coefficients of the quantile regressions. The second is changes in the values of the variables determining earnings - i.e., workers' personal and productive characteristics, and job characteristics. Within these two broad categories, the decomposition also quantifies the contribution of specific determinants of earnings – for example, the ownership structure – to inequality. We can thus estimate the effect of changing returns to the state sector and a changing employment share of the state sector on the gini coefficient for earnings in urban China.

The rest of the paper is structured as follows. In Section 2, we discuss the evolution and current state of the state sector since the late 1970s. Section 3 introduces the data and econometric methods. Sections 4 and 5 give the regression results and decomposition of wage income inequality, respectively. Section 6 presents the summary and conclusions.

2. The Evolution and Current State of the State Sector since the Late 1970s

Prior to the economic reform, wages were institutionally determined according to a national

system of grades, scales and seniority, with education and skill receiving little reward (Knight & Song, 1993, pp. 221–239; Zhang et al. 2005). From 1981, and in particular after 1986, the Chinese government allowed SOEs to implement flexible pay schemes according to their profitability (Dai, 1994). Although initially the floating pay or bonus was not allowed to be more than 5% of an SOE's total wage expenditure, this limit was gradually abolished; moreover, the SOE reform of 1986 allowed larger pay differentials within each SOE, it was difficult to monitor workers' productivity so that floating wages or bonuses were just distributed equally among workers (Meng, 2000, p. 83). Because of the soft budget constraints and no accountability for business failure, the objective of SOE managers was not maximization of profits but maximization of the welfare of SOE workers in terms of wages and bonuses; sometimes bank loans were used to pay large bonuses when the SOE made a loss (Walder, 1987, 1989). In fact, the SOE managers were also incentivized to raise the pay for their workers. The reason for this is that the Chinese government restricted the pay gap between the SOE managers and SOE workers. For example, the government decreed that the pay gap between the SOE managers and SOE workers be not more than 2-3 fold even for those profit-making SOEs in the period from 1986 to 1992 (Chen et al. 2005). Based on 1985–1992 firm data, Meng (2000, p. 107) found that retained profits were the main determinant of wages in SOEs, whereas in private firms, it was the productivity of workers that determined pay. Therefore, with the exception of frequent increases in bonuses and subsidies of all types,² the wage-setting mechanism of SOEs was broadly unchanged until the mid-1990s when the radical SOE reform was implemented.

After Deng Xiaoping's southern tour in 1992, China's reform and marketization accelerated. A series of reform measures were carried out, such as abolishing the double-tract price system,³ unifying tax regime, tightening credit and the like. Of them, the most radical reform was the mass retrenchment of superfluous workers and "retaining the big SOEs while disbanding the small ones". There had been serious over-manning and efficiency problems in the SOE sector; weren't it for the bank loans and financial subsidies from the state budget, many SOEs would have been bankrupt long time ago.⁴ The implementation of the new reform measures

 $^{^{2}}$ The share of bonuses in the annual earnings of SOE workers increased from 2.4% in 1978 to 23.3% in 1993, and that of all other subsidies rose from 6.5% to 25.1% in the same period (Meng, 2000, p. 84).

³ After having produced what the state demanded according to the planned prices, SOEs can sell their products on market according to market price; likewise, after having sold the planned quantity of grain to the state at the state procurement price, the rural household can trade their agricultural products on free market.

⁴ Roughly 40% of the large and middle-sized SOEs were making loss in 1991 (Zhu Rongji, 2011, Vol. 1, p. 15), the number of loss-making SOEs accounted 43% of them and the total losses reached RMB 88.3 billion in 1995 (Zhou, 1996), in the middle of 1990s on the whole the middle and small sized SOEs were making loss (Naughton, 2007, p. 302), in 1996 the share of SOEs'

exacerbated the difficulties encountered by those loss-making SOEs, such as SOEs have to pay market prices for key resources, the same value-added taxes as other nonstate firms, and cannot rely on bank loans to pay bonuses and other subsidies to their workers. Confronted with the ever-increasing number of loss-making SOEs and ever-rising heavy budget burden caused by subsidizing SOEs, the Chinese government determined to reform the 125 thousand strong SOEs. The SOE reform was put on trial in 1994 and finally implemented in 1997. A consequence of this was that in 2002 the number of retrenched SOE workers reached 28 million that accounts for half of SOE workforce (State Council News Office, 2004), and the number of SOEs was reduced (by 74%) from 125 thousand in the mid-1990s to 32 thousand in 2004 (Naughton, 2007, p. 313). A key part of China's SOE reform was to transform the remaining SOEs, which are profitable and monopolistic with strategic importance for the country's economy, into modern market-oriented enterprises. The reform and restructure of SOEs was followed by soaring wages and bonuses in the SOE sector. Even in the period of mass retrenchment, there was pay rise for those still-employed SOE workers (Appleton et al. 2005; Bai et al. 2006). Besides, SCDR (2007) reported that the pay gap between the monopolistic SOEs and other enterprises has been increased largely in the period of 1990-2005.

The creation of a State Asset Supervision & Administration Commission (SASAC) in June of 2003 marked a significant change in the state administration of SOEs. One of the major changes is the total wages and salaries contract regime, by which in each year SASAC will negotiate with each of the centrally-controlled SOEs over the amount of wages and salaries for next year. Soon this practice spread to the whole country. The total wages and salaries contract regime effectively restrains the unreasonable pay rise of SOE workers and increase of wage cost. However, the SOEs are reluctant to employ new workers because of the constraint of the total wages and salaries contract. This might be the reason that the employment share of SOEs had further been reduced in the period from 2002 to 2007 (Table 4). The SOEs almost own the whole country's state asset and its amount has been increasing all the time. Therefore, the SOEs' shrinking employment share is not proportional to its amount of asset. Additionally, the implementation of annual salary system for managerial staff in the SOEs leads to a rise in pay gap within SOEs, for instance, the annual compensation for SOE managers is 9-10 times higher than the average annual wages of SOE workers (Liao *et al.* 2006; Bai, 2008), and Chen et al.

profit in China's GDP is almost zero (Naughton, 2007, p. 304).

(2005) finds that the position-related consumption of SOE managers is more than ten-fold of their annual salary.

As for the public sector, the 1993 reform of pay rules for civil servants allowed regions to set up their own extra-pay scheme, which related the rise in salaries of regional civil servants to local economic growth. In other words, the reform sanctioned an arrangement under which provincial governments could set the salaries for their own civil servants according to their own budgets. Since then, the pay differentials for civil servants have gradually been getting larger between provinces or between government agencies in the same region (Dai *et al.*, 2005; Liu, 2006). In the period from 1998-2002 the pay for civil servants and other public sector workers had been raised three times (Zhu Rongji, ⁵ 2011, vol. 4, p. 482). Furthermore, the pay for civil servants is higher than that in SOEs, collective enterprises and private firms (Dai *et al.*, 2005).

Taken together, the SOEs per se, the sector's size and determinants of wage structure have been transformed considerably since the economic reform and in particular after the radical SOE reform of the 1990s. At the same time, the income inequality in urban China has drastically increased, for example, the Gini coefficient of urban wage income rose from 0.24 in 1988 to 0.44 in 2007 (Table 1). It was for these reasons that China's most respected economist, Professor Jinglian Wu (2006), argued that the main causes of the rapid growth in income inequality are corruption and the state-owned monopolistic industries. Therefore, a follow-up question is how China's urban wage inequality has been affected by the changes in employment share and wage structure of the SOE sector.

We hypothesize that the high pay in the public sector and the monopolistic SOEs is one of the forces responsible for the increase in the urban wage gap. To test this hypothesis, we employ the 1988, 1995, 2002 and 2007 China Household Income Project (CHIP) urban household survey data, and Machado & Mata's (2005) parameterized counterfactual decomposition method and an extension of their decomposition method based on multiple quantile regressions to identify the effect of the change in pay structure and employment shares in the public sector and SOEs on urban wage inequality.

⁵ Zhu Rongji was the deputy prime minister from 1992 to 1997, and the prime minister from 1998-2002. During his reign, Zhu Rongji carried out the most spectacular reform of the State-Owned Enterprises and other significant marketization reform.

3. Data and Methods

3.1 Data

We use 1988, 1995, 2002 and 2007 urban household survey data from the China Household Income Project (CHIP). The surveys were designed by a team of international scholars including the authors and researchers at the Institute of Economics of the Chinese Academy of Social Sciences. Subsamples were drawn from the larger annual national household income survey of the National Bureau of Statistics. The subsamples cover 10 out of 31 provinces in 1988, 11 in 1995, 12 in 2002 and 9 in 2007. The questionnaires designed for CHIP are more detailed than those in the official income surveys, particularly with respect to the measurement of income and labor issues. For the cross-sectional analysis, we construct a real wage variable that includes bonuses, price subsidies (which were important in 1988 before being largely withdrawn), regional allowances for working in Tibet or in mountainous areas, income in-kind and income from secondary jobs.⁶ With respect to adjustment of the price level, we adjusted all wage income from all years to 2002 constant prices according to the urban consumer price indices published by China's National Statistical Bureau. Results from these surveys are in Griffin & Zhao (1993), Riskin *et al.* (2001), Li & Sato (2006), Gustafsson *et al.* (2008) and Li *et al.* (2011).

These surveys cover only households with urban registration (*hukou*). Consequently, we exclude rural–urban migrant households because they are denied urban *hukou* status. However, estimating the wage functions of urban residents separately from those of migrants is appropriate because, as administrative controls make it extremely difficult for people of rural origin to acquire urban *hukou*, any sample selection bias is likely to be negligible. Confining the analysis to the subpopulation holding urban *hukou* allows us to examine what causes the increase in wage inequality for a specific group of people so that we may draw inferences about corresponding changes in economic well-being. Nonetheless, we are omitting an important dimension of the urban labor market by not being able to include migrants. Moreover, the potential importance of this omission has increased over time with the sharp increase in rural–urban migration during the sample period. Controls over rural–urban migration were

⁶ Our wage variable, although fairly comprehensive, does exclude some nonmonetary benefits such as pension accruals, health insurance and housing. The contributions of these variables may vary under differing forms of ownership and over time. Nominal wages were converted into real wages by deflating by regional urban CPIs.

relaxed significantly in 1988 when the government allowed farmers to conduct business in cities, as Linge & Forbes (1990) discussed. The rise in rural–urban migration is likely to have affected particular groups of urban workers differentially. Specifically, rural–urban migration is likely to have had a moderating impact on the wages of urban residents that have similar characteristics as, or working in similar sectors to, migrants. Hence, the effect is greater on urban workers with less education and those working in the service and commercial sectors.⁷

Table 1 reports the change in urban wage inequality for the period from 1988 to 2007. The Gini coefficient of urban wage income increased sharply from 0.237 in 1988 to 0.345 in 1995, and then remained unchanged in 2002, but increased further to 0.439 in 2007. The Lorenz curves of wage income during these four years show the same trend (see Figure 1). The 90/10 wage ratio increased sharply from 2.82 in 1988 to 6.43 in 2007. The wage gaps in the nonstate sector are higher than those in the public sector and SOEs, but the difference between them is diminishing (see Table 2). Finally, the wage gaps within each sector and each subsector increased continuously during the period.

Figure 2 exhibits raw (unconditional) daily wage gap curves between the state sector (comprising the public sector and SOEs) and the nonstate sector based on percentile points, ranged from low to high, using CHIP data for all four years. In general, pay in the state sector is higher than in the nonstate sector. In 1988, for the 10th percentile point, the wage in the state sector is 1.5 times that in the nonstate sector, but this ratio decreases to 1.1 for the 90th percentile point. In 1995, the inverse relationship between the wage gap (of the state and nonstate sectors) and the wage level strengthened. For example, the ratio of wages in the state and nonstate sector still paid more than the nonstate sector in 2002, the gap is smaller than that for 1995 below the 35th percentile of the wage distribution, whereas the wage gaps for these two years above the 35th percentile are roughly the same. In 2007, the wage distribution and close to that for 2002 in the rest of the wage distribution.

⁷ In the 1999 survey, the more settled migrants were surveyed and so we can compare their characteristics with those of workers with urban *hukou* (see Table 1 of Appleton *et al.*, 2004). Over half the migrants were self-employed and so may not be directly competing for jobs with urban residents (only around 1% of whom were self-employed). Migrants tended to be less educated (averaging three fewer years of education), as well as including more young and male workers. Migrants' distribution across jobs was very different from urban residents, with a large concentration being service or retail workers and relatively few working as highly skilled or industrial workers.

3.2 Methods

We employ the quantile regression method to estimate the extended Mincerian earnings function (Mincer, 1973). Let $Q_{\theta}(w_{it}|X_{it})$ for $\theta \in (0,1)$ denote the θ^{h} quantile of (log) wages w of an individual *i* in year *t* for given explanatory variables, *X*. For each year, we model these conditional quantiles separately by:

$$Q_{\theta}\left(\ln W_{it} \left| X_{it} \right.\right) = X_{it}^{'} \beta_{t}(\theta), \qquad (1)$$

where $\beta(\theta)$ is a vector of quantile coefficients, and *X* is a vector of explanatory variables. The coefficients are estimated following Koenker and Bassett's (1978) quantile regression estimator. In practice, we run 19 quantile regressions (from quantile points 0.05, 0.10, 0.15, ..., 0.95) for each of the four rounds of cross-sectional data.⁸ Afterward, we plot a curve for the 19 coefficients on the dummy variable (with 1 indicating a worker employed by the state sector and 0 by the nonstate sector) against the 19 quantile points of the wage distribution for each year. From these curves we can observe the wage premium of the state sector versus the nonstate sector across the entire wage distribution over time.

The quantile regression has a number of advantages over conventional ordinary least squares (OLS) regression. Most importantly, it provides a complete representation of the conditional distribution of wages whereas the OLS regression focuses only on the conditional mean.⁹ This is particularly crucial for understanding inequality because a standard regression focuses only on central tendency. Furthermore, the quantile approach allows one to test whether some determinants of wages have different effects on workers higher up the conditional wage distribution than on those lower down. For example, we can examine whether the wage premium of the state sector varies at different points of the conditional wage distribution. The quantile approach recognizes the unobserved heterogeneity of workers and thus generates a richer picture of the determinants of wages.

Quantile regressions are far from perfect. Outliers and skewed distributions (often observed in large-scale cross-section household survey data) make quantile regression residuals deviate

⁸ The distance between any two quantile points is 0.05.

⁹ Other advantages of the quantile approach are that it is less sensitive to outliers, more robust to departures from normality (Koenker and Bassett, 1978) and has better properties in the presence of heteroscedasticity (Deaton, 1992).

from the independent and identical distribution (i.i.d.) assumption. If the i.i.d. assumption for the regression residuals no longer held, the statistical inference from the regression results would be invalid (Hao & Naiman, 2007, p. 44–47). To circumvent this technical difficulty, the bootstrap method is applied to the quantile regressions (Kocherginsky *et al.*, 2005). As bootstrap quantile regressions do not need the i.i.d. assumption, they are more robust and practical. For this reason, bootstrap quantile regressions are employed in this paper.

Some care must be taken in interpreting the results of the quantile analysis, because they pertain to *conditional* quantiles, not unconditional ones. Thus, a worker at a high-wage quantile would be one who receives high wages relative to his/her values of the observed determinants of wages, X, rather than simply a high-wage worker per se. Another way of saying this is that a worker at a high-wage quantile will tend to have favorable unobserved determinants of wages. This shows the difficulty in interpreting the results. As some determinants of wages are unobserved, it is not clear exactly what they are. They could include measurement error, for example, or random factors (a worker's good fortune in chancing upon a high-paying position). However, there is some interest in these unobservables; for example, unobserved personal characteristics affecting earnings are often labeled "ability" in the theoretical literature (although they may also encompass determination, ambition and factors such as personal appearance). Unobserved characteristics of a job may also be interesting; for example, we do not observe firm size or profitability, but rent-sharing theories imply these may have significant effects on earnings. In our exposition, for brevity, when describing the patterns in our findings, we often refer to high quantiles unconditionally as representing high-wage workers—as is common in the applied literature; however, this is an oversimplification and a more nuanced interpretation focusing on unobservables is often invoked when trying to explain our results.

One of our main purposes of using quantile regressions is to study the evolution of pay differentials between the state and nonstate sectors for the period from 1988 to 2007. To this end, we control for the variables that apply across all four years of CHIP urban household survey data in the function (1). In detail, these variables are workers' schooling, experience and experience squared, dummy variables for sex, Communist Party membership, non-Han Chinese ethnicity, job characteristics in terms of occupations and industrial sectors, and provincial dummies. The variable of interest in this paper is a dummy variable identifying a worker's employer with 1 indicating the state sector and 0 the nonstate sector.

The focus of this paper is on exploring the effect of the state sector's wage structure and employment share on urban wage inequality for the period from 1988 to 2007. For this reason, we employ Machado and Mata's (2005) method (MM method hereafter) to decompose changes in wage inequality into changes attributable to two sources. One is the change in wage structure in terms of the coefficients on the various explanatory variables. The other is the change in the distribution of explanatory variables, i.e., the change in workers' personal and productive characteristics, and in job characteristics. In detail, following Machado and Mata (2005), if $\alpha(.)$ are summary statistics for wages—such as the Gini coefficient—then we can decompose the changes in α as follows:

$$\alpha \left(f \left(w(1) \right) \right) - \alpha \left(f \left(w(0) \right) \right)$$

= $\left[\alpha \left(f^{*} \left(w(1); X(0) \right) \right) - \alpha \left(f^{*} \left(w(0) \right) \right) \right] +$ (2)
 $\left[\alpha \left(f^{*} \left(w(1) \right) \right) - \alpha \left(f^{*} \left(w(1); X(0) \right) \right) \right] + residual.$
covariate

where f(w(t)) denotes the estimator of the marginal density of w (the log wage) at t based on the observed sample $\{w_i(t)\}, f^*(w(t))$ denotes the estimator of density of w at t based on the generated sample $\{w_i^*(t)\}, \text{ and } t = 0, 1$. The counterfactual densities are denoted by $f^*(w(1); X(0))$, for the density that would result in t = 1 if all covariates had their t = 0 distributions, $f^*(w(1); X^i(0))$, for the wage density in t = 1 if only X^i (part of the covariates) were distributed as in t = 0.

Furthermore, the contribution of an individual covariate x_i to the total wage inequality could be measured by looking at indicators such as:

$$\alpha\left(f^*(w(1))\right) - \alpha\left(f^*(w(1);x_i(0))\right). \quad (3)$$

Along the lines of MM method, we are able to counterfactually measure the contribution of an individual coefficient β_i to the change in wage inequality by observing:

$$\alpha \left(f^* \left(w(0); \beta_i(1) \right) \right) - \alpha \left(f^* \left(w(0) \right) \right), \quad (4)$$

where $f^*(w(0); \beta_i(1))$ denotes the estimator of the density of *w* with all covariates at period 0 and all coefficients, apart from $\beta_i(1)$, from period 0; $\beta_i(1)$ denotes the coefficient of x_i from period 1. With formula (4), we then counterfactually analyze the change in the wage inequality and wage gap caused by specific changes in the pay structure, such as changes in the returns to education.

In essence, Machado and Mata's counterfactual decomposition is an extension of Oaxaca's (1973) decomposition for quantile regressions.¹⁰ A key exercise of the MM method is to obtain the generated sample $\{w_i^*(t)\}$. To obtain $\{w_i^*(t)\}$, one first needs to estimate *n* quantile regression coefficients $\hat{\beta}^t(\theta_i)$ (where θ_i denotes the quantile point), and then generate a random sample of size *n* with replacement from the rows of X(t) denoted by $\{x_i^*\}_{t=1}^n$, and finally get $\{w_i^*(t) = x_i^*(t), \hat{\beta}^t(\theta_i)\}_{t=1}^n$.¹¹ For details, the reader is referred to Machado and Mata (2005).

Finally, because China's economic transition has occurred gradually, the counterfactual decomposition is implemented period by period. In detail, these periods are 1988–1995, 1995–2002 and 2002–2007, based on the availability of the CHIP data. The same explanatory variables were applied in all the four years' earning functions.

4. Results from Quantile Regressions

In this paper, the state sector consists of two subsectors. One is the public sector, which covers civil servants, various state-funded institutions such as schools, universities, hospitals, etc. The other is the SOE sector. Therefore, before examining the wage gap between the state sector and nonstate sector, it is necessary to investigate the pay differential between the public sector and SOE sector. According to the CHIP urban household surveys, the public sector's employment share rose from 30% in 1995 to 32% in 2007, whereas the SOEs' share fell sharply from 51% in 1995 to 34% in 2002 and further to 18% in 2007 (see Table 4). This decline was the result of the mass retrenchment of SOE workers in the 1990s. To determine whether there is any pay differential between the public sector and SOEs, we employ CHIP urban household survey data

¹⁰ As is well known, there is a potential index number problem with such exercises.

¹¹ According to Machado and Mata (2005), one needs to randomly draw θ_i of sample size *n* from $\theta_i^{(0, 1]}$. However, in practice, we only take 999 quantile points with equal distance from the uniform distribution on [0, 1] by following Albrecht *et al.* (2003) and Rica *et al.* (2008). In other words, we estimated 999 quantile regressions for quantile points 0.001, 0.002, 0.003, ..., 0.999 on [0, 1] for the earnings function for each of the four years.

for 1995, 2002 and 2007 in which the public sector and SOEs can be identified by exploring the pay gap between these two subsectors.¹² The OLS regression results reveal that the pay in the public sector was 8% higher than that in SOEs in 1995; however, this pay gap drops to 5% in 2002, and to -2% in 2007 although it is statistically insignificant in the latter.¹³ The multiple quantile regression results (see Figure 3) demonstrate that in both 1995 and 2002, the pay gap between the public sector and SOEs steadily decreases as the wage level increases, and the curves for the two years are broadly indistinguishable, except for the top quartile of the wage distribution. For the top quartile, the pay gap is insignificant for 1995; however, for 2002 it declines continuously to -11% as the wage level increases. At 2007, the pay in the public sector is no longer higher than that in SOEs except for the top quintile, indicating that the SOE workers are better paid than the public sector workers for quintiles other than the top one.

Another obstacle to overcome is that the CHIP 2007 urban household survey data do not contain information about whether a person is a Communist Party member. Therefore, it becomes unclear whether the extended Mincerian earning function for 2007 is comparable to that of other years. Considering that 2002 is closer to 2007, we compare the earning function for 2002 containing the Communist Party membership variable and one for the same year without this variable. Figure 4 presents the wage premium curves for the state sector versus nonstate sector from the 2002 earning functions with and without the Communist Party membership variable estimated using multiple quantile regressions. The wage premium curve without the Communist Party membership variable is slightly higher than that with the party membership variable at almost all quantile points of the wage distribution. This fact demonstrates that the wage premium curve of the state sector without the party membership variable absorbs part of the effect of the wage premium of the party membership variable is included does not have a significant effect on the wage premium of the state sector versus nonstate sector. This result suggests that the earnings function for 2007 is comparable to those for 1988, 1995 and 2002.

4.1 Evolution of the wage premium of state sector versus nonstate sector

¹² The ownership variables include public sector, collective enterprise, foreign-owned and joint-venture enterprises, private sector and others with SOEs as the reference variable. Other variables such as workers' sex, Communist Party membership, ethnicity, occupation, industrial sectors, and provincial dummies are the control variables.

¹³ Because of space limitations, the OLS regression is not reported in this paper, but it is available upon request.

Figure 5 presents the evolution of the wage premium curves of the state sector versus nonstate sector. For 1988, the wage premium of the state sector versus nonstate sector decreases as the wage level increases, with the largest premium of 24% occurring at the fifth percentile of the wage distribution, 14% at the median and 8% at the 95th percentile. In 1995, this trend is further strengthened, in particular the wage premiums of the state sector versus nonstate sector at the fifth, median and 95th percentiles of the wage distribution increased to 34%, 24% and 17%, respectively. This raises several questions. What caused the pay of the state sector to be significantly higher than that of nonstate sector in 1988 and 1995? Why was this wage premium further raised in 1995 compared with 1988? And finally, why did the wage premium fall as the wage level increased?

The history of SOE reform reviewed in Section 2 of this paper might shed light on the above questions. The Chinese government started allowing SOEs to implement flexible pay schemes according to their profitability in the early 1980s. The objective of SOE managers was not maximization of profits but maximization of the welfare of SOE workers in terms of wages and bonuses, because there are the soft budget constraints and no accountability for business failure and that the pay gap between a SOE managers and the average SOE worker should not be more than 2-3 fold. Additionally, retained profits were the main determinant of wages in SOEs, whereas in private firms, it was the productivity of workers that determined pay. Therefore, with the exception of frequent increases in bonuses and subsidies of all types, the wage-setting mechanism of SOEs was broadly unchanged until the mid-1990s when the radical SOE reform was implemented. This problem, which resulted from poor institutional design, meant that the pay in SOEs was higher than that in private firms and that the magnitude of this pay differential increased in the period from 1988 to 1995.

Moreover, floating wages or bonuses, which were permitted since the early 1980s, were distributed equally among workers within each SOE because of the difficulty to monitor workers' productivity. By contrast, the wage of a worker in a private firm was determined by his/her productivity. Therefore, we expect that the wage gap will be much larger in private firms than in SOEs, which this study confirms (see Tables 2 and 3). Taken together, the pay in SOEs is more or less equally distributed among workers, whereas the wage gap in private firms is large, which accounts for the wage premium of the state sector being larger than that of the nonstate sector in the lower part of the wage distribution and smaller in the upper part. Chamberlin (1994) found that the wage premium of trade union members is higher in the lower part of the wage distribution.

This suggests that the SOEs in China played a similar role to that of trade unions in the US in terms of wage negotiations; that is, the SOEs are more effective in protecting low-wage workers.

Deng Xiaoping's southern tour in 1992 cleared the ideological obstacles for further reform. Consequently, after 1992 China's reform and marketization deepened and accelerated. The radical SOE reform resulted in a sharp fall of the employment share of SOE sector and less but much strengthened SOEs that are profitable and monopolistic with strategic-importance for the country's economy. Other reform measures also have had a significant impact on SOEs, such as abolishing the double-track system forced SOEs to pay market prices for key resources, unifying the tax regime caused SOEs to pay the same value-added taxes as other nonstate firms, and tightening credit deprived SOEs of using bank loans to pay bonuses and other subsidies to their workers. Despite of these reform measures, the unretrenched SOE workers shared the profit brought about by the improved efficiency of SOEs, and the public sector workers enjoyed pay rise three times for the period from 1997 to 2002, as discussed in Section 2 of this paper. What effect did these reforms have on the wage-setting mechanism of the state sector for the period from 1995 to 2002? Figure 5 shows that in 2002 the wage premium of the state sector versus the nonstate sector declined to 1988 levels (in the first quintile and the fourth quartile, the premium was even less than that in 1988), and hence was much lower than that in 1995. What factors caused the 2002 wage premium to be so far below the 1995 level? After the Asian financial crisis in the late 1990s, the Chinese economy experienced deflation until around 2002. Additionally, the urban labor market was heavily flooded by the 30 million retrenched SOE workers and the almost 100 million rural-urban migrants.¹⁴ Therefore, there existed no wage inflation pressure in the nonstate sector.¹⁵ Any pay rises in the private sector would have been a consequence of productivity change that might be resulted from the unprecedented large-scale inflow of FDI¹⁶ and the improved efficiency of domestic nonstate sector. In summary, the fall of the wage premium of the

¹⁴ The number of rural-urban migrants dramatically soared from 15 million in 1990 to 98 million in 2003 (News Office of the State Council, 2004), and further to 145 million in 2009 (Ministry of Human Resources and Social Security, 2010). The reform of financial and banking sector aimed at solving bad loans resulted in sharp reduction of financial supports to rural industrial activities and hence large-scale closure of rural industrial enterprises, which in turn forced rural surplus laborers migrating to urban areas for employment (Huang, 2008).

¹⁵ In contrast to the shrinking of the SOE sector, non-state sectors are significantly expanding. For example, the share of employment in urban areas created by the non-state sectors rose from 26% in 1992 to 68% in 2001 and further to 78% in 2007 even without accounting for jobs being brought about by the rural-urban migrants (NSB, 1993, 2002 and 2008). Therefore, at the turn of the century, China's labor market had become more competitive than in the late 1980s.

¹⁶ Attracted by the huge market, cheap labor and high economic growth rate, tremendous amount of foreign direct investment flows to China so that China replaced America as the top recipient of FDI in 2003 (53 billion US dollars, OECD, 2004), the figure climbing to 90 billion US dollars in 2009 (Wen, 2010). The foreign-owned enterprises paid the much higher wages than domestic ones to recruit highly skilled and motivated workers (Appleton, *et al.* 2005; Xia et al, 2009).

state sector versus the nonstate sector in 2002 relative to 1995 could only be the result of significant pay rises in the nonstate sector during this period.

In 2007, the wage premium of the state sector was still less than that of 1988 over the first quintile of the wage distribution. However, for the second to fifth quintiles, the wage premium of the state sector for 2007 was higher than that for both 1988 and 2002, but still lower than that for 1995. Furthermore, the wage premium of the state sector for 2007 is close to constant for the middle 50% of the wage distribution. In spite of this, over the fourth quartile, the wage premium of the state sector for 2007 decreases as the wage level increases. In general, the wage premium of the state sector increased significantly during the period from 2002 to 2007. What factors could have led to this result? The SOEs' situation changed dramatically after 2002 with the completion of the radical SOE reforms. The remaining SOEs were profitable and monopolistic with strategic importance to the country, such as banks, financial firms, telecoms, and aviation, railway and energy enterprises. According to the National Statistical Bureau, the growth rates of wages in the SOE sector and nonstate sector were 14.12% and 12.76%, respectively, during the period from 2002 to 2009, and the SOEs' wage premium relative to nonstate firms increased from 0.30% in 2002 to 10.36% in 2009.¹⁷ Gu & Feng (2008), Yue et al. (2010) and Jia (2011), among others, also found that the pay gap between monopolistic SOEs and other enterprises has been expanding. Therefore, Wu (2006) speculated that the expanding wage inequality was caused by the monopolistic SOEs and corruption.

4.2 Reasonable and unreasonable components of the wage premium of the state sector versus nonstate sector

Following Yue *et al.* (2010), we also explore the extent to which the wage premium of the state sector versus nonstate sector is reasonable. We estimate Oaxaca–Blinder decomposition¹⁸ on

¹⁷ The pay gap between the average wages of SOEs and the nonstate sector calculated from the NSB report is somewhat different from that derived using the CHIP urban household surveys. The latter was based on randomly sampled urban household survey data. Therefore, it is closer to reality.

¹⁸ In this paper, the Oaxaca–Blinder decomposition based on OLS regression is conducted using the downloadable STATA procedure "decomp". The STATA procedure "decomp" was written by Ian Watson, who closely follows Blinder's exposition and uses both his method and his terminology. We adopt the "decomp" procedure because it suits our objective. In the Oaxaca–Blinder decomposition of the pay gap between the state sector and nonstate sector in this study, the wage structure of the nonstate sector is decided by market competition, whereas the nonmarket factors play significant roles in the pay setting of the state sector. For example, in the state sector, a worker's political affiliation is an important determinant of earnings. In the monopolistic SOEs, monopolistic profit may increase the pay of the workers. Therefore, the wage premium of the state sector versus nonstate sector is the result of positive discrimination. Thus, in the process of the Oaxaca–Blinder decomposition, the regression coefficients of the earnings function for the nonstate sector should be set as the reference, and the characteristics of the state sector versus nonstate sector. The reverse decomposition of the "decomp" procedure is required in this study.

the dummy variable of being employed in the state sector in the extended Mincerian earnings function of this paper for the four rounds of the CHIP urban household survey. The purpose of this is to measure reasonable and unreasonable components of the wage premium of the state sector versus nonstate sector.

The Oaxaca–Blinder decomposition based on OLS regressions shows that the unreasonable part of the wage premium of the state sector versus nonstate sector was in the range of 43–44% for the years 1988, 1995 and 2002, but that it climbed to 81% in 2007 (see Table 5). Put it differently, the unreasonable part of the wage premium of the state sector had been kept at roughly the same level for the period from 1988 to 2002 but shot up sharply in 2007. Yue *at al.* (2010) found that the unreasonable part of the wage premium of the monopolistic SOEs versus nonmonopolistic firms is as high as 60%.¹⁹ Recall that the wage premium of the public sector versus SOEs decreased as the wage level increased in 1995 and 2002, whereas in 2007 the opposite occurs. As mentioned above, after the reforms, the remaining SOEs were profitable and monopolistic. These monopolistic SOEs could obtain favorable treatment from various government agencies and banks (such as easy credit, lower taxes, right to control scarce resources), set monopolistic prices, harvest monopolistic profits and hence pay their workers wages well above market prices. This could be the main factor that boosted the unreasonable part of the wage premium of the state sector.

5. Counterfactual Analysis: Effect of the Wage Structure and Employment Share of the State Sector on Urban Wage Inequality

Having examined the wage gap between the state sector and nonstate sector and its evolution during the period from 1988 to 2007, we now examine how urban wage inequality was affected by the change in the wage structure and employment share of the state sector (encompassing the public sector and SOEs); in so doing, we test our hypothesis that the high pay in the public sector and SOEs caused the increase in urban wage inequality. As stated in Section 3, the change in wage income inequality can be counterfactually decomposed by the change in the wage structure (the change in regression coefficients of the earnings function) and the change in workers' characteristics (the explanatory variables of the earnings function). Through this

¹⁹ Because rural-urban migrants are not covered in the CHIP urban household survey, we use Yue *et al.*'s (2010) Oaxaca–Blinder decomposition of the pay gap between monopolistic SOEs and other firms when the rural–urban sample are excluded.

counterfactual decomposition, we can observe how the wage inequality was influenced by change in any part of the wage structure (any coefficient or any group of coefficients of the earnings function) and in any explanatory variables. In this paper, we focus on how the urban wage inequality was modified by the change in the wage premium of state sector versus nonstate sector (regression coefficient of the dummy variable "state sector") and employment share of the state sector, respectively.

In practice, we employ the change in the Gini coefficient and various percentile ratios of the wage distribution to describe how urban wage inequality was affected by change in the wage premium of state sector or regression coefficient of the state sector (all other regression coefficients and all explanatory variables remain unchanged) and by the change in employment share of the state sector (all other explanatory variables and all regression coefficients remain unchanged) (see Tables 6 and 7). Percentile ratios of the wage distribution include 90/10, 75/25, 90/50 and 50/10. We carried out 10 rounds of counterfactual simulation to examine the effect of change in the wage premium of the state sector and the effect of change in the employment share of the state sector on urban wage inequality, respectively, and then averaged the wage inequality and gap indicators of the 10 rounds of counterfactual simulation. The purpose of this is to avoid bias from any single simulation result. In each round of the counterfactual simulation, we randomly select 999 observations of the explanatory variables from the data for any particular year.

5.1 Effect of the regression coefficient of the state sector on urban wage inequality and wage gap

Effect of the wage premium of state sector versus nonstate sector on urban wage inequality is different in each transitional period of the Chinese economy. Compared with 1988, the sharp rise in the wage premium of the state sector versus nonstate sector over the entire wage distribution in 1995 resulted in an increase in urban wage inequality (see Figure 5, Tables 6 and 7). For example, the Gini coefficient increased by 0.007 (if the MM decomposition is based on the 1988 wage structure and explanatory variables) or by 0.003 (if the decomposition is based on the 1995 wage structure and explanatory variables). The wage gap indicators such as 90/10, 75/25 and 50/10 showed significant signs of increases in the wage gap. However, the increase in the wage gap is asymmetric because the 50/10 indicator increased while the 90/50 indicator remains largely unchanged. This implies that the wage gap for workers with wages below the

median level increased whereas the gap for workers above the median wage level was largely unaffected. Taken together, the sharp rise in the wage premium of the state sector versus nonstate sector for the period from 1988 to 1995 resulted in an increase in urban wage inequality and a rise in wage gap for those low wage workers whose wages were below the median level of the wage distribution.

The mass retrenchment of SOE workers commenced in 1995 and was complete by around 2002. Compared with 1995, the fall in the wage premium of the state sector versus nonstate sector in 2002 resulted in a fall in urban wage inequality. For instance, the Gini coefficient fell by 0.012 (if the MM decomposition is based on the 1995 wage structure and explanatory variables) or by 0.014 (if the decomposition is based on the 2002 wage structure and explanatory variables). The wage gap (in terms of 90/10, 75/25 and 90/50) also declined. Nevertheless, the fall in the wage gap for workers in the upper half of the wage distribution is larger than that for workers in the lower half. Overall, the fall in the wage premium of the state sector versus nonstate sector for the period from 1995 to 2002 brought about a fall in urban wage inequality and a reduction of wage gap for those high wage earners whose wages were above the median level of the wage distribution.

During the period from 2002 to 2007, the remaining large monopolistic SOEs seized opportunities and achieved rapid growth, large monopolistic profits and steady pay rises for their employees, particularly their managerial staff. Consequently, the clear rise in the wage premium of state sector versus nonstate sector in the upper half of the wage distribution in this period caused an increase in urban wage inequality. The Gini coefficient increased by 0.003 (if the MM decomposition is based on the 2002 wage structure and explanatory variables) or by 0.002 (if the decomposition is based on the 2007 wage structure and explanatory variables). The wage gap indicators of 90/10, 75/25, 90/50 and 50/10 all increase, although high-wage earners received larger pay rises than low-wage earners. As a whole, the rise in the wage premium of the state sector versus nonstate sector for the period from 2002 to 2007 led to an increase in the urban wage inequality particularly for the upper class whose earnings were above the median of the wage distribution.

5.2 Effect of the employment share of the state sector on urban wage inequality and wage gap

Clearly, there is consistency between the results of the MM counterfactual decomposition of the wage structure (or regression coefficient) of the state sector versus the nonstate sector based on the beginning year and closing year's explanatory variables. By contrast, there is clear inconsistency between the outcomes of the decomposition of the change in the employment share of the state sector versus nonstate sector based on the beginning year and closing year's wage structure particularly for the last two of the three periods (see Tables 6 and 7). For the period from 1988 to 1995, the employment share of the state sector remained largely unchanged so that the inconsistency is not apparent. However, the employment share of the state sector declined from 79% in 1995 to 65% in 2002 and further to 49% in 2007. If the counterfactual decomposition is based on the beginning year of the state sector results in a reduction in urban wage inequality using the Gini coefficient and urban wage gap in terms of 90/10 and 50/10; however, if it is based on the closing year of the two periods, the fall in the employment share of the state sector results.

To investigate the cause of this contradictory result, we extend the MM counterfactual decomposition to examine the effect of the change in the state sector employment share on urban wage inequality to all decile points of the employment share. We exemplify this simulated counterfactual decomposition method by using the 1995 wage structure and other explanatory variables as the base. In fact, during the period from 1995 to 2002, the employment share of the state sector fell from 79% to 65%. However, in the simulated counterfactual decomposition the employment share of the state sector in 1995 is kept constant, while assuming that the state sector's employment share can counterfactually be changed to 10%, 20%, ..., 90%. The same kind of counterfactual decomposition is implemented for 1988, 2002 and 2007.

Table 8 reports the simulation results of the counterfactual decomposition of the effect of variation in the state sector's employment share on urban wage inequalities, which are based on the wage structure and other explanatory variables for 1988, 1995, 2002 and 2007. From Table 8, when the employment share of the state sector is counterfactually changed to 10%, 20%, ..., 90% in each year, the difference between the counterfactual and factual urban wage inequality (the former minus the latter) changes from large to small and also from positive to negative. However, because the state sector has different employment shares in each of the four years, the transition from positive to negative in the difference between the counterfactual and factual and factual

urban wage inequalities in each year occurred at different levels of the counterfactual employment shares of the state sector. It can be observed from Table 8 that the levels of the counterfactual employment share of the state sector, on which the difference between the counterfactual and factual urban wage inequalities changes from positive to negative, decline along with the fall in the factual employment share of the state sector.

In addition, in the simulation of the counterfactual decomposition for each year, when the counterfactual employment share of the state sector is higher than the factual one in any particular year, the difference between counterfactual and factual urban wage inequality is negative. For the simulation results in Table 8, we assumed that the transition of the state sector's employment share is from factual to counterfactual, as in the decomposition results in Table 6. If we multiply every simulated number in Table 8 by "–1", we obtain the simulation results in reverse order—the transition of the state sector's employment share from counterfactual to factual, which is consistent with Table 7. Under this reverse order, when the state sector's counterfactual employment share is greater than the factual, urban wage inequality increases. Recall that the state sector's employment share has been decreasing since 1994. As a result, it is inevitable that contradictory results occur between the simulation results computed for the base year and those based on the current year for each of the two periods from 1995 to 2002 and 2002 to 2007.

In essence, the clear contradictory between the outcomes of the decomposition of the change in the employment share of the state sector versus nonstate sector based on the beginning year and closing year's wage structure could be brought about by the difference in the wage structure of the beginning year and closing year of a decomposition period. China's economy and in particular her SOE sector had experienced drastic structural transformation in the periods from 1995 to 2002 and 2002 to 2007. Therefore, there should be fundamental change in the wage structure of the beginning year and closing year in each of the two periods. In addition, the MM counterfactual decomposition could be regarded as a kind of prediction method. Prediction is always made on the base year. Therefore, the MM decomposition of the change in employment share of the state sector versus nonstate sector should be based on the beginning year's wage structure.

Taken together, whether the fall in the state sector's employment share leads to an increase or decrease in urban wage inequality depends on the order of the counterfactual decomposition. In

the point of prediction method, the counterfactual decomposition of how the change of employment share of the state sector affects urban wage inequality should be based on the beginning year's wage structure for any period of interest; in this tread, the magnitude of the fall in employment share of the state sector in the periods from 1995 to 2002 and 2002 to 2007 rightly falls in the ranges that result in decrease of urban wage inequality. The above extension of the MM decomposition method could be extended to consider the effect of proportional changes in other variables in earning functions such as education, sex or occupation.

6. Summary

This paper examined the effect of change in the state sector's wage structure and employment share on urban wage inequality by employing the 1988, 1995, 2002 and 2007 CHIP urban household survey data. As our methodology, we employed multiple quantile regressions and MM counterfactual decompositions. We also extended the MM counterfactual decompositions to all decile points in order to investigate the effect of change in the state sector's employment share on urban wage inequality. The results of the multiple quantile regressions and MM counterfactual decomposition revealed that the sharp fall in the state sector's employment share, which was caused by the radical SOE reform in the second half of the 1990s, resulted in falls of urban wage inequality especially for the below median wage workers for the periods from 1995 to 2002 and 2002 to 2007, and the fall in the wage premium of the state sector versus nonstate sector for the period from 1995 to 2002 also gave rise to a fall in urban wage inequality; however, the rise in the wage premium of state sector versus nonstate sector before and after the SOE reform led to increases in urban wage inequality for the periods from 1988 to 1995 and 2002 to 2007.

The state sector consists of the public sector and SOEs. The SOEs' share of total urban employment fell from 50% in 1995 to 18% in 2007, while the public sector's share remained at about 30%. The results of the multiple quantile regressions suggest that pay in the public sector was higher than that in SOEs in both 1995 and 2002, but the gap decreased as the wage levels increase in each of the two years. In 2007 there were no significant pay differentials between the public sector and SOEs, except for the top quintile where the pay in the SOEs was higher than that in the public sector. This implies that after 2002 there were larger pay rises in SOEs than in the public sector.

Before the SOE reforms, SOE managers had no accountability for business failure and less credit constraints but more incentive to raise pay for workers, and the aim of SOEs was not the maximization of profits and total wealth, but rather the maximization of the pay and welfare of workers. Therefore, the main determinant of wages in SOEs was the amount of retained profit, rather than the productivity of the workers. The consequence of this former regime was that the wage premium of the state sector versus nonstate sector increased considerably in the period from 1988 to 1995, which caused an increase in urban wage inequality.

During the SOE reform, the wage premium of the state sector was reduced temporarily, leading to a fall in urban wage inequality for the period from 1995 to 2002. However, the SOEs that survived the reform are large and monopolistic ones, characterized by opportunistic monopolistic profit and payment of high salaries. Therefore, since 2002, the rate of pay rises for the SOE workers has not only been faster than that of the public sector but has also been faster than that of the private sector, which led to an increase in urban wage inequality. The Oaxaca–Blinder decomposition showed that the unreasonable part of the wage premium of the state sector versus nonstate sector remained at about 44% until 2002, but then increased sharply to 81% in 2007. The monopolistic SOEs were able to set monopolistic prices, earn monopolistic profits and pay their employees wages that were higher than market prices. These might be the chief reasons that the wages in SOEs increased faster than did those in the public sector.

More than 30 years has passed since China's economic reforms were initiated in 1978. During these decades, the most spectacular and influential reforms were the abolishment of the collective agricultural regime in the early 1980s and the radical SOE reform in the 1990s. The rural reform, which returned the collectivized land to rural households, resulted in a large rise in agricultural output and a significant fall in rural poverty. Therefore, it was a pure Pareto improvement—there were no losers during the reform. However, the radical SOE reform led to the retrenchment of half of the SOE workforce and a massive reduction in the number of SOEs. The SOE reforms cast off the burden of subsidizing loss-making SOEs by using the majority of the state fiscal income, and hence laid a solid financial foundation for the new Hu–Wen deal that focused on improving human development conditions of the country.²⁰

²⁰ The Hu–Wen new deal is referred to as Hu Jingtao and Wen Jiabao's policy because they took their reign since 2002.

China's transitional market economy is still not perfect. The large monopolistic SOEs still play a dominant role and pay their employees very high salaries and welfare payments, which have led to the rise in urban wage inequality. For this reason, the decision makers of China should put more effort into monitoring and regulating the monopolistic SOEs.

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	wage mequanty and g	sup of aroun china		
	1988	1995	2002	2007
Gini coefficients	0.23720	0.34449	0.34781	0.43937
General entropy				
GE(-1)	0.23790	0.57580	0.28577	0.40476
GE(0)	0.10786	0.23536	0.21241	0.33339
GE(1)	0.10766	0.22646	0.21514	0.44610
GE(2)	0.14837	0.37869	0.29688	1.97441
Atkinson index				
A(0.5)	0.05124	0.10560	0.10053	0.16938
A(1)	0.10224	0.20971	0.19137	0.28351
A(2)	0.32240	0.53523	0.36368	0.44737
Mean	17.60	28.20	49.73	98.54
Median	16.53	23.99	41.83	69.24
Standard deviation	9.41	24.61	38.32	198.31
Ratios of wages of pe	rcentile points			
90/10	2.82	5.04	4.96	6.43
75/25	1.65	2.17	2.29	2.80
90/50	1.57	1.99	2.08	2.57
50/10	1.80	2.54	2.38	2.50
Skewness	7.16	11.09	4.32	32.64

Table 1: Indicators of wage inequality and gap of urban China

Source: CHIP 1988, 1995, 2002 and 2007 urban household survey.

When only relative values are involved, wages are in nominal price; whereas when absolute values are needed, wages of other years are all adjusted to the 2002 constant prices according to the urban consumer price index of China Statistical Yearbooks of various years.

	19	988	19	95	20	02	20	07
	state	Nonstate	state	Nonstate	state	Nonstate	state	Nonstate
Gini coefficients	0.221	0.278	0.326	0.396	0.314	0.392	0.392	0.481
General entr	ору							
GE(-1)	0.135	0.515	0.452	0.870	0.228	0.343	0.321	0.471
GE(0)	0.092	0.149	0.206	0.314	0.174	0.264	0.265	0.397
GE(1)	0.095	0.144	0.206	0.295	0.174	0.290	0.326	0.577
GE(2)	0.136	0.188	0.351	0.486	0.224	0.476	1.013	3.181
Atkinson inde	ex							
A(0.5)	0.045	0.069	0.095	0.137	0.083	0.128	0.133	0.205
A(1)	0.088	0.139	0.186	0.270	0.160	0.232	0.233	0.328
A(2)	0.213	0.508	0.475	0.635	0.313	0.407	0.391	0.485
Mean	18.36	14.98	29.828	22.05	53.83	42.19	104.55	92.57
Median	17.35	13.68	25.44	17.95	47.66	31.82	<i>79.99</i>	59.59
Standard	0.45	0 70	25 000	21.65	26.01	41.10	151 41	225 70
deviation	9.45	0.70	23.000	21.05	50.01	41.19	131.41	235.70
Ratios of wa	ges of perce	entile points		-	-	-	-	-
90/10	2.59	3.43	4.35	6.71	4.30	5.45	5.64	6.90
75/25	1.57	1.79	2.03	2.46	2.02	2.36	2.50	2.83
90/50	1.52	1.71	1.92	2.25	1.91	2.46	2.28	2.80
50/100	1.70	2.01	2.26	2.99	2.25	2.22	2.47	2.46
Skewness	8.20	3.79	11.90	7.63	3.59	5.60	26.886	31.719

Table 2: Indicators of wage inequality and gap of urban China by ownership sector

When only relative values are involved, wages are in nominal price; whereas when absolute values are needed, wages of other years are all adjusted to the 2002 constant prices according to the urban consumer price index of China Statistical Yearbooks of various years.

			198	88					199	95					200	02					200)7		
	Publ	SO	Collecti	Priva	Forei	Othe	Publ	SO	Collecti	Priva	Forei	Othe	Publ	SO	Collecti	Priva	Forei	Othe	Publ	SOE	Collecti	Priva	Forei	Othe
	ic	Es	ve	te	gn	rs	ic	Es	ve	te	gn	rs	ic	Es	ve	te	gn	rs	ic	s	ve	te	gn	rs
	secto		firms	firms	firms		secto		firms	firms	firms		secto		firms	firms	firms		secto		firms	firms	firms	
	r						r						r						r					
Moon	18.3		14.82	18.0	24.67	12.0	32.8	28.0	21.10	18.0	34 38	19.5	59.2	48.9	34 71	42.5	67.03	40.4	106.	101.	80.07	88.8	125.1	65.0
Wiean	6		14.02	8	24.07	3	7	3	21.10	5	54.50	0	2	1	54.71	1	07.05	7	48	13	87.77	9	3	6
Median	17.3		13 77	11.5	22.08	10.5	28.1	23.5	17.63	12.8	28.23	16.6	53.2	41.1	28.00	31.8	54.07	30.0	82.8	71.9	58.40	55.8	86.30	46.1
	5		15.77	9	22.98	5	9	3	17.05	2	26.23	6	3	2	28.00	7	54.97	3	5	9	30.49	7	80.30	4
Standar																								
d	9 15		7 78	19.2	15 75	8 90	23.7	25.8	20.20	17.5	28 75	17.6	34.6	36.5	24.63	42.7	50.46	43.8	101.	212.	266.03	252.	157.7	72.3
deviati	7.45		1.10	2	15.75	0.70	5	6	20.20	0	20.75	9	4	3	24.05	3	50.40	6	19	97	200.05	95	3	6
on																								
Gini	0.22			0.47		0.40	0 30	0.33		0.45		0.44	0.28	0.33		0.38		0.30	0.37	0.41		0.48		0.40
index	1		0.255	4	0.369	2	2	8	0.372	2	0.362	8	7	0.55	0.336	6	0.351	9	9	4	0.463	9	0.436	5
	1			-		2	2	0		2		0	,	1		0				-				5
Ratios of	wages o	n variou	ıs percentil	le points																				
90/10	2.50		2.00	11.8	7 70	13.7	2.01	4 72	5 69	0.24	5 40	19.9	2 70	4.27	4.27	5.26	5.02	5.26	5 00	5.00	5.05	7.00	7.00	c 00
	2.39		5.09	9	1.19	8	5.01	4.75	3.08	9.54	5.40	5	3.79	4.57	4.57	5.50	5.05	5.50	5.00	5.00	5.25	7.00	7.00	0.00
75/25	157		1 72	2 17	2.65	2.01	1 0 1	2.15	2.25	200	2.21	4.22	1 0 2	2.14	2.17	2.20	2.52	2.50	2.46	2.45	2.20	267	2.80	2.25
	1.57		1.75	5.17	2.05	2.91	1.01	2.15	2.25	2.00	2.21	4.22	1.05	2.14	2.17	2.30	2.32	2.50	2.40	2.45	2.39	2.07	2.80	2.23
90/50	1.50		1.64	3 23	2.10	2 20	1 90	2.00	2 17	2.04	2 1 2	2 20	1 00	2.03	2 22	2 41	2.22	2 30	2.40	2 20	2 50	3.00	2.02	2.68
	1.52		1.04	5.25	2.19	2.39	1.09	2.00	2.17	2.94	2.12	2.39	1.00	2.03	2.23	2.41	2.22	2.39	2.40	2.29	2.30	3.00	2.92	2.08
50/10	1 70		1.80	3 68	3 56	5 75	1.02	2.36	2.62	3 17	2.54	8 33	2 10	2.15	1.06	2 22	2 27	2.24	2.45	2 10	2 10	2 22	2.40	2.24
	1.70		1.07	5.00	5.50	5.75	1.92	2.50	2.02	5.17	2.34	0.55	2.10	2.15	1.90	2.22	2.21	2.24	2.45	2.19	2.10	2.35	2.40	2.24
Skewn								14.6												25.4		33.7		
ess	8.20		3.46	3.41	0.68	1.03	5.90	14.0	9.26	2.54	3.65	2.57	2.47	4.69	2.68	5.69	3.75	6.41	6.99	23.4 7	17.83	0	9.05	5.54
								1												/		0		

Table 3: Indicators of wage inequality and gap of urban China by subsectors

When only relative values are involved, wages are in nominal price; whereas when absolute values are needed, wages of other years are all adjusted to the 2002 constant prices according to the urban consumer price index of China Statistical Yearbooks of various years.

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	1988	1995	2002	2007
No. of observations	17,733	12,245	10,133	6,938
Ownership structure of the employed u	ırban workers (%)			
State sector	77.67	79.04	64.76	49.83
Public sector		29.66	30.90	31.82
SOEs		50.95	33.86	18.00
Urban collective firms	20.28	15.06	6.86	5.36
Private firms	0.77	1.65	20.72	34.48
Foreign-owned & joint-venture firms	0.36	1.27	2.17	7.08
Other ownerships	0.92	2.98	5.49	3.26

	1988	1995	2002	2007
Amount attributable:	1.0	5.6	33.9	24.8
- due to endowments (E):	14.5	23.1	18.5	4.9
- due to coefficients (C):	-13.4	-17.5	15.4	19.9
Shift coefficient (U):	24.5	34.9	-0.6	0.6
Raw differential (R) {E+C+U}:	25.5	40.5	33.3	25.4
Adjusted differential (D) {C+U}:	11.1	17.4	14.8	20.6
Endowments as % total (E/R):	56.7	57.0	55.6	19.2
Discrimination as % total (D/R):	43.3	43.0	44.4	80.8

 Table 5: Oaxaca-Blinder Decomposition of pay differential between the state and nonstate sectors

Wages of other years are all adjusted to the 2002 constant prices according to the urban consumer price index of China Statistical Yearbooks of various years.

U = unexplained portion of differential (difference between model constants).

D = portion due to discrimination (C+U).

	C	hange of coefficier	nts		Thange of covariate	es
	1988-1995	1995-2002	2002-2007	1988-1995	1995-2002	2002-2007
	0.007	-0.012	0.003	-0.001	-0.001	0.000
Gini	(.005, .009)	(014,007)	(.003, .004)	(005, .002)	(006, .002)	(003, .002)
	(+10)	(+0)	(+10)	(+1)	(+5)	(+7)
	1.44	-2.60	0.96	-0.01	-0.95	-0.95
Mean	(1.36, 1.52)	(-2.75, -2.48)	(0.92, 1.02)	(-0.05, 0.02)	(-1.16, -0.79)	(-1.13, -0.79)
	(+10)	(+0)	(+10)	(+4)	(+0)	(+0)
	1.30	-1.78	0.55	0.00	-0.85	-1.14
Median	(1.07, 1.48)	(-2.10, -1.47)	(0.10, 0.95)	(-0.20, 0.10)	(-1.08, -0.47)	(-1.87, -0.44)
	(+10)	(+0)	(+10)	(+6)	(+0)	(+0)
Standard	1.18	-4.07	0.53	-0.04	-0.97	-0.29
deviation	(0.69, 2.60)	(-8.11, -2.14)	(-0.48, 1.10)	(-0.18, 0.05)	(-2.43, -0.23)	(-1.61, 0.41)
ueviation	(+10)	(+0)	(+8)	(+3)	(+0)	(+3)
	0.74	-1.94	-0.32	0.03	-0.33	0.20
Skewness	(-0.54, 4.43)	(-7.34, 0.30)	(-1.06, 0.12)	(-0.15, 0.30)	(-1.88, 0.43)	(-0.68, 0.71)
	(+7)	(+1)	(+2)	(+6)	(+4)	(+9)
	0.13	-0.11	0.11	-0.02	-0.09	-0.09
90/10	(0.06, 0.18)	(-0.34, 0.09)	(0.04, 0.18)	(-0.06, 0.02)	(-0.31, 0.09)	(-0.21, 0.22)
	(+10)	(+1)	(+10)	(+3)	(+1)	(+1)
	0.04	-0.06	0.05	-0.01	0.01	-0.03
75/25	(0.01, 0.05)	(-0.08, 0.00)	(0.02, 0.09)	(-0.04, 0.01)	(-0.06, 0.07)	(-0.09, 0.02)
	(+10)	(+0)	(+10)	(+1)	(+5)	(+3)
	0.02	-0.05	0.04	-0.01	-0.01	0.02
90/50	(-0.01, 0.05)	(-0.08, 0.01)	(0.00, 0.06)	(-0.03, 0.00)	(-0.06, 0.03)	(-0.04, 0.05)
	(+9)	(+1)	(+10)	(+1)	(+4)	(+8)
	0.06	0.01	0.01	0.00	-0.04	-0.06
50/10	(0.01, 0.09)	(-0.09, 0.13)	(-0.04, 0.04)	(-0.03, 0.03)	(-0.15, 0.04)	(-0.13, 0.08)
	(+10)	(+6)	(+6)	(+5)	(+3)	(+1)

Table 6: MM counterfactual decomposition of the effect of wage structure and employment share of state sector versus nonstate sector on urban wage inequality based on the beginning year's wage structure

The decompositions are based on the beginning year's wage structure and explanatory variables for the periods from 1988 to 1995, 1995 to 2002, and 2002 to 2007.

	C	hange of coefficier	nts	Ŭ	hange of covariate	es
	1988-1995	1995-2002	2002-2007	1988-1995	1995-2002	2002-2007
	0.003	-0.014	0.002	-0.001	0.007	0.008
Gini	(0.001, 0.005)	(-0.015, -0.009)	(0.001, 0.003)	(-0.003, 0.002)	(0.005, 0.01)	(-0.001, 0.023)
	(+10)	(+0)	(+10)	(+4)	(+10)	(+9)
	2.14	-4.55	1.37	-0.15	-0.55	-0.85
Mean	(2.07, 2.28)	(-4.96, -4.14)	(1.22, 1.51)	(-0.26, -0.05)	(-0.73, -0.31)	(-2.05, 1.85)
	(+10)	(+0)	(+10)	(+0)	(+0)	(+2)
	1.84	-2.88	0.73	-0.24	-0.77	-1.19
Median	(1.59, 2.09)	(-3.38, -2.07)	(-0.25, 1.80)	(-0.86, 0.09)	(-1.50, -0.21)	(-2.31, -0.06)
	(+10)	(+0)	(+9)	(+2)	(+0)	(+0)
Standard	2.13	-8.48	0.54	0.10	0.54	15.45
deviation	(1.27, 3.54)	(-18.70, -3.90)	(-0.33, 2.30)	(-0.23, 0.68)	(-0.29, 1.64)	(-12.36, 109.29)
deviation	(+10)	(+0)	(+8)	(+4)	(+7)	(+7)
	0.44	-1.23	-0.16	0.10	0.08	0.52
Skewness	(-0.15, 2.79)	(-4.59, 0.41)	(-0.45, 0.35)	(-0.29, 0.28)	(-0.31, 0.75)	(-1.86, 3.99)
	(+8)	(+3)	(+2)	(+9)	(+4)	(+5)
	0.14	-0.26	0.13	0.08	0.27	0.11
90/10	(-0.02, 0.29)	(-0.36, -0.13)	(-0.07, 0.25)	(-0.20, 0.23)	(0.11 0.48)	(-0.21, 0.36)
	(+9)	(+0)	(+8)	(+7)	(+10)	(+7)
	0.05	-0.06	0.05	0.02	0.08	0.03
75/25	(0.00, 0.08)	(-0.10, -0.02)	(0.01, 0.08)	(-0.04, 0.07)	(0.04, 0.17)	(-0.02, 0.08)
	(+10)	(+0)	(+10)	(+8)	(+10)	(+8)
	0.00	-0.07	0.03	0.00	0.04	0.01
90/50	(-0.04, 0.03)	(-0.13, -0.02)	(-0.02, 0.09)	(-0.05, 0.06)	(0.00, 0.08)	(-0.06, 0.07)
	(+8)	(+0)	(+7)	(+6)	(+10)	(+5)
	0.06	-0.04	0.02	0.04	0.08	0.03
50/10	(-0.01, 0.11)	(-0.10, 0.01)	(-0.06, 0.06)	(-0.08, 0.13)	(0.03, 0.17)	(-0.06, 0.11)
	(+9)	(+0)	(+8)	(+8)	(+10)	(+7)

Table 7: MM counterfactual decomposition of the effect of wage structure and employment share of state sector versus nonstate sector on urban wage inequality based on the closing year's wage structure

The decompositions are based on the closing year's wage structure and explanatory variables for the periods from 1988 to 1995, 1995 to 2002, and 2002 to 2007.

Table 8: MM counterfactual decomposition of the effect of state sector' employment share on urban wage inequality

	Gini	90/10	75/25	90/50	50/10
77% to 10%	0.008	0.11	0.03	0.05	0.01
77% to 20%	0.008	0.08	0.02	0.04	0.01
77% to 30%	0.006	0.06	0.02	0.02	0.01
77% to 40%	0.004	0.03	0.03	0.02	0.00
77% to 50%	0.003	0.02	0.01	0.01	0.00
77% to 60%	0.001	0.00	-0.01	0.01	-0.01
77% to 65%	-0.001	-0.04	-0.01	-0.01	-0.02
77% to 70%	0.001	0.01	-0.01	0.01	0.00
77% to 75%	-0.001	-0.03	-0.01	0.00	-0.01
77% to 80%	-0.003	-0.06	-0.02	-0.01	-0.03
77% to 85%	-0.003	-0.05	-0.02	-0.01	-0.02
77% to 90%	-0.004	-0.08	-0.03	-0.01	-0.04

Table 8a: based on 1988's wage structure and other explanatory variables

Table 8b: based on 1995's wage structure and other explanatory variables

	Gini	90/10	75/25	90/50	50/10
79% to 10%	0.005	0.12	0.00	0.03	0.02
79% to 20%	0.009	0.10	0.03	0.04	0.00
79% to 30%	0.004	0.09	0.02	0.04	-0.01
79% to 40%	0.006	0.04	0.00	0.01	0.00
79% to 50%	0.004	0.19	0.02	0.03	0.06
79% to 60%	0.004	0.09	0.03	0.04	0.00
79% to 65%	-0.001	-0.09	0.01	-0.01	-0.04
79% to 70%	0.001	-0.05	0.01	0.02	-0.05
79% to 75%	-0.003	-0.12	0.00	0.00	-0.06
79% to 85%	-0.006	-0.09	-0.03	-0.02	-0.02
79% to 90%	-0.004	-0.18	-0.05	-0.01	-0.07

Table 8c: based on 2002's wage structure and other explanatory variables

	Gini	90/10	75/25	90/50	50/10
65% to 10%	0.010	0.10	0.02	0.07	-0.03
65% to 20%	0.008	-0.02	-0.02	0.06	-0.07
65% to 30%	0.004	-0.02	-0.01	0.02	-0.03
65% to 40%	0.004	0.02	-0.02	0.06	-0.05
65% to 45%	0.001	-0.11	-0.01	0.01	-0.06
65% to 50%	-0.002	-0.11	-0.02	0.02	-0.07
65% to 55%	-0.001	-0.08	-0.04	0.04	-0.08
65% to 60%	-0.002	-0.10	-0.04	0.01	-0.06
65% to 70%	-0.004	-0.13	-0.05	-0.02	-0.04
65% to 75%	-0.003	-0.15	-0.07	-0.04	-0.03
65% to 80%	-0.005	-0.21	-0.05	-0.01	-0.09
65% to 85%	-0.008	-0.21	-0.07	-0.04	-0.06
65% to 90%	-0.011	-0.25	-0.08	-0.04	-0.08

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	Gini	90/10	75/25	90/50	50/10
10% to 50%	-0.011	0.01	0.03	-0.03	0.03
20% to 50%	-0.008	0.08	0.01	-0.01	0.04
30% to 50%	-0.002	0.15	0.04	0.01	0.05
35% to 50%	0.002	0.10	0.02	0.00	0.04
40% to 50%	0.003	0.02	0.03	-0.02	0.03
45% to 50%	-0.003	0.04	0.04	0.01	0.01
55% to 50%	0.007	0.09	0.05	0.03	0.01
60% to 50%	0.004	0.24	0.07	0.04	0.05
65% to 50%	0.008	0.11	0.03	0.01	0.03
70% to 50%	0.007	0.21	0.06	0.04	0.04
75% to 50%	0.012	0.06	0.02	0.04	0.02
80% to 50%	0.009	0.20	0.05	0.06	0.02
85% to 50%	0.013	0.24	0.07	0.07	0.03
90% to 50%	0.019	0.30	0.09	0.08	0.04





