

2011

# 2011-18 Do Employees in the Public Sector Still Enjoy Earnings Advantages?

Juan Yang

Sylvie Démurger

Shi Li

Follow this and additional works at: <https://ir.lib.uwo.ca/economicscibc>



Part of the [Economics Commons](#)

---

## Citation of this paper:

Yang, Juan, Sylvie Démurger, Shi Li. "Do Employees in the Public Sector Still Enjoy Earnings Advantages?." CIBC Centre for Human Capital and Productivity. CIBC Working Papers, 2011-18. London, ON: Department of Economics, University of Western Ontario (2011).

Paper Revised August, 2012

**Do Employees in the Public Sector Still  
Enjoy Earnings Advantages?**

by

**YANG Juan, Sylvie Démurger and LI Shi**

**Working Paper # 2011-18**

**October 2011**



***CIBC Working Paper Series***

Department of Economics  
Social Science Centre  
The University of Western Ontario  
London, Ontario, N6A 5C2  
Canada

This working paper is available as a downloadable pdf file on our website  
<http://economics.uwo.ca/centres/cibc/>

## **NINE**

### **Do Employees in the Public Sector Still Enjoy Earnings Advantages?**

YANG Juan, Sylvie Démurger, and LI Shi

## I. Introduction

Three decades of economic reform have brought tremendous changes in every sector of the Chinese economy. The labor market is no exception, and it was particularly affected by important policy and institutional changes at the turn of the century. On the one hand, the state-sector reform was accelerated after the Chinese Communist Party's September 1997 Fifteenth National Congress, which encouraged both the corporatization of large state-owned enterprises (SOEs) and the restructuring of small SOEs. On the other hand, the Congress also recognized private enterprises as an important component of the economy and placed an emphasis on rule of law. As a direct consequence, the urban labor market was reshaped due to the unprecedented growth in unemployment and the reallocation of labor from the public to the private sector. At the same time, competition among workers in the urban labor market increased sharply due to the massive rural labor-force exodus, which led to an estimated 140 million rural workers in the cities by 2008.

In the context of a transitional economy, these dramatic changes raise a number of issues about the direction of the urban labor market. A key aspect to be explored is whether the labor market has become market-oriented and whether enterprises with different ownerships operate competitively. Academic research using data collected from the mid-1990s to the early twenty-first century highlights the incompleteness of the reforms and the "unfinished economic revolution" (Lardy 1998), as well as the remaining rigidities in a segmented labor market with distinct rules for wage determination and limited labor mobility between segments (e.g., Chen, Démurger, and Fournier 2005; Démurger et al. 2006; Dong and Bowles 2002; Knight and Song 2003; Wang 2005). Evidence from mid-1990s micro data shows that workers in the public sector had very few incentives to move and one of the main reasons for this immobility was the higher-than-market-clearing-level earnings premium provided to

workers in state-owned units (Chen, Démurger, and Fournier 2005; Zhao 2002). Moreover, for the period from 1995 to 2002 Démurger et al. (2006) find strong evidence of increasing segmentation across ownership, with the gap between the privileged segments of the labor market and the most competitive segments widening over time.

Policy-related rationales for studying labor-market segmentation issues are related to both efficiency, as illustrated in the literature on the public-private sector earnings gap in developing countries or economies in transition (Adamchik and Bedi 2000; Boeri and Terrell 2002; Falaris 2004; Lokshin and Jovanovic 2003) and income inequalities (Meng and Zhang 2001). A multi-tiered labor market in which wages are not only determined by skill differentials, but also by different institutional arrangements may have strong implications in terms of both labor allocation across sectors and income distribution among workers. In China, where the so-called iron rice bowl (*tiefanwan*) of life-time employment and the associated welfare state dominated for years before it was completely dismantled in 1994 (Knight and Song 2005), the issue of public-sector efficiency appears to have special importance. Moreover, the question of income distribution is essential to any government concerned about smooth economic development and social safety. With the growth of the Chinese economy and rising average wages, the earnings gap triggered vigorous debate. In this context, ownership is also a fairly important issue since it is linked to whether the government can provide an equal and efficient business environment for all sorts of companies to develop and maximize social welfare. Given that the number of enterprises in the public sector decreased from about 99 percent of all companies in 1978 to merely 10 percent in 2007, it is also interesting to explore whether the remaining public-sector enterprises still enjoy a privileged position in the labor market due to specific government policies.

Macroeconomic data on the average wages of staff and workers in urban China show an increasing trend since the mid-1990s (Figure 9.1). The average wage in 2007 was 2,060 yuan per month, 5.7 times higher than the average wage in 1995 (in constant 2007 prices). Although the increase was rapid for every type of ownership, some discrepancies emerged over time, the most remarkable being a narrowing gap between the public and private sectors. Indeed, whereas average wages in 1995 were the highest in the “other ownership” (private sector) category, they were lower than those in the SOEs in 2007. Similarly, Peking University’s College Students Employment Survey of more than 100 universities in 2002 and 2007 shows that whereas the first employment intention of students in 2002 was to work in foreign-invested enterprises, in 2007 it was the SOE sector. This change calls for further research to investigate whether this was due to any discriminatory behavior or to specific powers of certain types of enterprises.

<Insert Figure 9.1 about here>

The 2008 release of 2007 data from the China Household Income Project (CHIP) project makes it possible to analyze whether China’s labor market is still segmented by ownership in terms of earnings differentials. The comprehensive information on personal characteristics provided by the available micro datasets enables us to investigate wage compensation by controlling for the individuals’ most important characteristics. Previous research on China’s labor-market segmentation utilized data for 2002 or earlier. However, during the 2002-7 period, China’s economic growth averaged 10.8 percent in real terms and China became increasingly integrated into global markets, especially after joining the World Trade Organization (WTO) in 2001. In addition, private companies that were allowed to enter the previously state-controlled areas, such as steel, aluminum, and automobiles, have been immensely successful and many have gone public and become among the top 500 companies in China. This implies that old-style companies like state-owned enterprises and urban

collective companies have to compete much more intensively with market-oriented companies, including private companies, joint-venture companies, and foreign companies.

Against the backdrop of the accelerating economic reforms between 2002 and 2007, we propose to investigate the trends and determinants of the earnings gap across ownership types during this period. We first analyze the average gaps by using the Oaxaca-Blinder decomposition technique. We then account for the different patterns in the various percentiles for different ownership types by applying the Juhn-Murphy-Pierce decomposition method.

The remainder of this chapter is organized as follows: Section II describes the development of various types of enterprises in China. Section III introduces the dataset and some descriptive statistics. Section IV discusses the econometric results of the earnings equations by enterprise ownership. Section V and Section VI describe the decomposition results of the earnings gaps across ownership types during the 2002-7 period. Section VII presents our conclusions.

## **II. Economic Reforms and the Evolution of Ownership**

After the People's Republic of China was founded in 1949, the means of production were gradually transferred to the state, and by 1956 private and individual economic activities had become illegal (Naughton 2007). In urban China, within the period of the First Five-Year Plan, the share of public ownership increased from 21.3 percent in 1952 to 92.9 percent in 1956 in urban China (Su 1999). When the economic reforms began in 1978, the national economy was strongly dominated by public ownership, which consisted of state-owned and collective enterprises. State-owned and collective (including township-village enterprises [TVEs]) enterprises accounted for 24 percent and 76 percent respectively of the total number of industrial companies (Su 1999), and produced 77 percent and 23 percent of the total industrial output (Naughton 2007).

One major feature of the economic reforms was to encourage the development of the non-state sector of the economy while reforming the organization of state-owned enterprises. By introducing a series of laws and regulations, the government gradually allowed private and foreign companies to co-exist with state-owned and collective companies. In 1988, the State Council issued the “Tentative Stipulations on Private Enterprises” to govern the registration and management of private firms, and in 1993, the Company Law was promulgated to provide a legal framework for the development of limited liability companies and shareholding companies (Démurger et al. 2006). Hence, various forms of non-public ownership, such as privately owned, foreign-invested, joint-venture, share-holding, stock, and self-employed companies, became alternatives to the state-owned companies. More recently, efforts have been made to ensure fairer competition between the public and the private sectors and to open more industries to the private sector. In 2003, new regulations allowed non-state enterprises to enter the steel, aluminum, and even some parts of the national defense industries. In February 2005, the State Council issued its “Thirty-six Suggestions to Encourage and Support Non-State-Owned Economic Development” in order to reduce the barriers to market entry and to stimulate private investment.

In addition to helping promote competition among companies, the development of the non-state sector helped allocate resources more efficiently. Before the reforms, because resources were allocated according to the plan and the economy was dominated by public ownership, there was no competition among enterprises or employees. Allowing private and foreign companies to enter the labor market led to improvements in the national economy as a whole and consequently to the promotion of prosperity. The other advantage of allowing the existence of private and foreign companies was the alleviation of employment pressures. With the baby boom and soldiers transferred to non-military sectors, the labor force grew by more than 10 million per year and the non-state sector became a major channel to absorb the new



labor force.

Hence, whereas employment in the public sector rose continuously until the mid-1990s, it began to decrease in 1995, with a huge deceleration in 1998 (-18 percent), the pivotal year in the SOEs reforms. Since then, the number of workers in SOEs and urban collective enterprises (UCEs) decreased from 144.6 million in 1995 to 71.4 million in 2007 (NBS 2008), a total decrease of 50 percent. As a consequence, the public-sector share of urban employment dropped from 76 percent to 24 percent during the period (Naughton 2007). In contrast to the downsizing of the public sector, the private-sector share of urban employment increased from 16 percent in 1995 to 42 percent in 2007. The remaining 34 percent in 2007 was made of “other” employment, which “picks up most of the migrants and unregistered businesses” (Naughton 2007, p. 190). The dramatic increase in the private-sector share of urban employment can be attributed to the development of both private or individual enterprises and foreign-invested enterprises beginning in the mid-1990s, as well as to the emergence of new forms of ownership, including limited liability corporations and share-holding corporations. From 1995 to 2007, employment in foreign-invested enterprises tripled (from 5.1 million to 25.8 million) and employment in private and individual enterprises almost quadrupled (from 20.4 million to 78.9 million). Moreover, the number of people employed in the new ownership forms increased tenfold, from 3.2 million in 1995 to 30.8 million in 2007. These figures clearly indicate a significant shift in the employment structure by the turn of the century as China experienced a situation somewhat similar to that in the Eastern European countries when the labor force moved from the public to the private sector.

### **III. Data and Descriptive Analysis**

#### **A. Summary Statistics by Ownership**

The data used in this chapter come from two sources: the CHIP, carried out in 2003 for the

year 2002, and the CHIP carried out in 2008 for the year 2007. For both surveys, the questionnaire was designed by Chinese and foreign researchers and implemented by China's National Bureau of Statistics (NBS).<sup>1</sup> The two datasets include three separate surveys: urban, rural, and migrant. In this analysis, we employ the urban survey that covers only urban residents.<sup>2</sup> The 2002 CHIP urban survey was collected from a population of 20,632, with 6,835 households in twelve provinces, and the 2007 CHIP urban survey was collected from a population of 14,699, with 5,003 households in nine provinces.

For the sake of comparison, we keep in our sample only observations of the jointly surveyed seven provinces. The seven provinces are Jiangsu, Anhui, Henan, Hubei, Guangdong, Chongqing, and Sichuan. In addition, we further restrict the sample to individuals between the ages of 16 and 60 for men and between the ages of 16 and 55 for women who were earning positive wages with full-time employment.<sup>3</sup> The final sample size totaled 5,430 workers in 2002 and 5,029 workers in 2007.

Enterprise ownership analyzed in the chapter is divided into five categories (see Table 9.1): state-owned enterprises (SOEs), government agencies or institutions (GAIs), urban collective enterprises (UCEs), private or individual enterprises (PIEs), and foreign-invested enterprises (FIEs). A comparison between 2002 and 2007 shows opposite trends in the public and the private sectors: the share of SOEs decreased from 35 percent to 19 percent, whereas the share of PIEs increased from 24 percent to 33 percent (Table 9.2). This raises the issue of how to classify enterprises according to ownership. In each survey, respondents were required to provide the ownership of their company. In the 2002 CHIP survey, the ownership was divided into thirteen types, and in 2007 it was divided into sixteen types. In order to simplify the analysis, we reduce these different types to five categories. The "SOE" category thus contains state-owned enterprises, state-controlled enterprises, and state-owned joint ventures. In other words, as long as the state share is dominant, no matter who owns the other shares

(whether foreigners or private Chinese investors), in our analysis the enterprise will still fall into the SOEs category. However, we classify the solely foreign-invested companies and foreign-owned joint-venture companies as FIEs. This classification choice may explain why, despite the substantial increase in foreign direct investment from 2002 to 2007, the share of FIEs in our analysis does not change significantly.

< Insert Table 9.1 about here >

< Insert Table 9.2 about here >

Descriptive statistics on the individual characteristics of different ownerships are shown in Table 9.2. The gender distribution does not change much across years, with males representing 56-57 percent of the urban workers and concentrated particularly in SOEs where they account for 59.5 percent and 61.5 percent of the total in 2002 and 2007 respectively. To some extent, this distribution suggests that males may enjoy some recruitment and income from the public sector. Yet a noteworthy change between 2002 and 2007 occurred in the UCEs where females were traditionally over-represented (Démurger, Chen, and Fournier 2007; Maurer-Fazio, Rawski, and Zhang 1999). In 2007, males accounted for 53.7 percent of workers in UCEs, against only 44 percent in 2002. Although it still was the lowest share of males across ownership, the difference was not significantly different from the other categories (with the exception of the SOEs). As documented further below, this change reflects the improving situation of the UCEs, where increased competition may have boosted productivity and attracted more talented workers.

A comparison between 2002 and 2007 shows a slight decrease in the average age of the workforce, but it was more marked in the UCEs and in the private sector than in the public sector (SOEs and GAIs). In both years, the public sector employed more older workers than the private sector. As expected, with the expansion of higher education after 1999, the average educational attainment of the workforce, measured in years of schooling, substantially

increased over time, by almost one year during our 5-year period (from 11.34 years to 12.22 years). Except for the GAIs, which employed the most-educated workers in 2002,<sup>4</sup> each ownership category benefited from the increase in the education level so that the absolute gap in the educational attainment of workers across ownership declined from 2.56 years to 2.09 years. This evolution indicates that in addition to public administration, FIEs were increasingly able to attract talented youth in 2007.

The average experience in the current job (expressed in years) was much shorter in 2007 than in 2002 for all the sectors except the GAIs. The sharpest decreases occurred in the semi-public sector (UCEs) and the private sector (both PIEs and FIEs). This evolution probably signals increased job mobility in these sectors, whereas jobs in the public sector (SOEs and GAIs) were still the most stable and hence individuals did not readily leave their positions there. Finally, the average size of companies experienced a decreasing trend between 2002 and 2007, with the SOEs and FIEs among the largest enterprises.

### **B. The Evolution of Earnings and their Distribution by Ownership**

Table 9.3 reports the summary statistics on earnings by ownership. Total annual earnings are composed of reported wages, bonuses, in-kind earnings, subsidies, pension income, and so forth. Hourly earnings are calculated by dividing the total annual earnings by the number of declared hours worked in a year. In addition, earnings are adjusted for provincial purchasing power differences by using an updated set of the Brandt and Holz (2006) urban provincial-level spatial price deflators in order to account for differences in living standards across cities.

< Insert Table 9.3 about here >

In the five-year period from 2002 to 2007, earnings differentials between enterprises of different ownership changed markedly. On average, real earnings almost doubled, but at a

different pace across enterprises. The state sector experienced the slowest growth in annual and hourly earnings (88-92 percent for the SOEs and 62-63 percent for the GAIs); in contrast, both the UCEs and the private sector experienced earnings increases of more than 110 percent (up to a maximum of 138 percent for hourly earnings in the UCEs). As opposed to what occurred between 1995 and 2002 (Démurger et al. 2006), the differentials across enterprises somehow re-adjusted in the direction of more equality due to the dramatic increase in earnings in both the UCEs and the PIEs. On the one hand, although total earnings were the highest in the GAIs in 2002, the much-slower increase in earnings in the GAIs between 2002 and 2007 moved them down to the second rank, below the FIEs.<sup>5</sup> On the other hand, the UCEs as well as the PIEs saw their relative positions improve dramatically (again unlike what occurred between 1995 and 2002), and the gap to average total earnings was reduced from 0.7 to 0.86 for the UCEs and from 0.81 to 0.94 for the PIEs. Last, SOEs stood at the middle and the almost doubling of earnings in this part of the state sector allowed workers to maintain their intermediate position, with a gap to average earnings very close to one during the two years.<sup>6</sup>

Another interesting point focuses on the ongoing convergence of working time between the public and private sectors. From 1995 to 2002, the number of hours worked per week continued to decrease in both PIEs and FIEs. However, in 2007 the working time increased slightly in the public sector, although it remained less than that in the private sector. One possible reason for this convergence is that the competition in the SOEs and GAIs sectors became more intensive and employees had to work harder to maintain their positions. Furthermore, the PIEs and FIEs began to pay more attention to employee rights.

The Gini coefficients highlight a general trend of increasing inequality in annual and hourly earnings. For the entire sample, the Gini coefficient for hourly earnings increased from 0.367 to 0.405 between 2002 and 2007. Although PIEs continuously exhibited the largest

earnings dispersion over time,<sup>7</sup> the increase in earnings inequality was more pronounced in the public sector (including the UCEs), which resulted in a convergence of the earnings distributions across sectors between 2002 and 2007.

Non-parametric kernel density estimations for the distribution of the logarithm of hourly earnings by ownership category and by year are presented in Figure 9.2.<sup>8</sup> For each year, the figure shows the distribution for the entire sample as well as for the ownership category subsamples.

< Insert Figure 9.2 about here >

The upper panel of Figure 9.2 displays the kernel density estimates for the year 2002. Hourly earnings in GAIs on average were higher than those in other sectors, which can be seen in both the position of the curve most to the right and the higher kurtosis. In addition, the spread is very narrow and highly concentrated around the mean. FIEs came second, with average earnings only slightly higher than those in SOEs but with a larger width, thereby illustrating a wider distribution. The hourly wages in PIEs were the lowest among the five sectors, with the distribution skewed to the right, indicating that some earnings in PIEs were fairly low.

As illustrated in the bottom panel of Figure 9.2, the patterns did not change much over time, except that the five lines seem closer in 2007 than they were in 2002. This further illustrates the converging trend of the hourly earnings gap among the five sectors. In 2007 the FIEs exhibit better hourly wage distributions than the GAIs. Together with the higher average hourly earnings, FIEs also exhibit a very flat tail in the left part of the distribution, indicating that there were not many low-wage earners in this sector.<sup>9</sup> Moreover, the distributions for the GAIs and UCEs are quite similar, except that the hourly wage distribution of the GAIs is on the right of the hourly wage distribution of the UCEs. Finally, the kurtosis is the highest in the SOEs, suggesting a sharper peak and fatter tails for the hourly earnings distribution in the

state sector.

#### IV. The Determinants of Hourly Earnings

Tables 9.4 and 9.5 present OLS estimations of an augmented Mincerian hourly earnings function (Mincer 1974) run separately by enterprise ownership and by year.<sup>10</sup> The Mincerian earnings equation takes the following form:

$$w_{ir} = \beta_{ir} X_{ir} + u_{ir} \quad (1)$$

where subscript  $r \in [1, 5]$  represents the five different ownership categories defined above.  $w_{ir}$  is the natural logarithm of hourly earnings (adjusted for provincial purchasing power differences) for individual  $i$  in enterprise  $r$ .  $X_{ir}$  is a vector of her individual characteristics and  $\beta$  gives the set of returns to each observed socio-demographic characteristic.  $X$  includes gender, education (measured in years of schooling, as reported in the surveys), work experience<sup>11</sup> and its square, work experience in the current occupation, on-the-job training (dummy variable), regional dummies for coastal provinces and for capital cities, and company size. The residual  $u_{ir}$  stands for all the unobservable factors that may affect individual hourly earnings  $w$ .

< Insert Table 9.4 about here >

< Insert Table 9.5 about here >

Returns to education are significant in all sectors for both years. They are much higher in GAIs and FIEs than in any other sector. A comparison over time reveals interesting changes. Indeed, returns to education exhibit an increasing trend in UCEs, FIEs, and GAIs between 2002 and 2007, but a decreasing trend in both SOEs and PIEs, resulting in a growing gap across sectors. Hence, the range of returns to education depending on enterprise ownership moved from 5.64 percent to 8.57 percent in 2002 to 3.81 percent to 9.04 percent in 2007.

Linear and quadratic terms in experience are significant in the public sector (SOEs and

GAI) as well as in the private sector (PIEs), but not significant in UCEs and FIEs in either 2002 and 2007. As discussed in Chen, Démurger, and Fournier (2005), the observed difference in experience earnings profiles between the public sector and the other sectors suggests that in SOEs and GAIs seniority remains an important component in the determination of wages. Interestingly, however, experience is also important in the private sector. A comparison between 2002 and 2007 shows much earlier earnings peaks in 2007, suggesting that older people saw their relative position deteriorating over time. Indeed, whatever the enterprise, in 2007 the experience profile began to decrease after twenty years of experience, whereas in 2002 it decreased after thirty years of experience. The introduction of another experience indicator that measures the number of years in the company adds some interesting results for the foreign-invested firms. Indeed, the associated coefficient turns out to be significant in 2007, suggesting that the experience that counts for FIEs is experience accumulated in the enterprise rather than overall experience (which may have also been accumulated in the less efficient public or semi-public sectors).

Returns to gender also exhibit noteworthy differences across ownership and over time. In 2002, being a male in a PIE increased log hourly wages by about 21.9 percent, whereas the increase was only 7 percent in GAIs. The “male premium” increased dramatically over time, especially in the public and the semi-public sectors, and reached levels between 16.5 percent (in GAIs) and 25 percent (in PIEs). This partly reflects findings by Li and Song (2010) that show that gender wage inequality increased during the 2002-7 period. Interestingly, FIEs do not appear to favor males over females since the coefficient for the gender dummy is never significant.

Finally, the coefficient estimates for being located in a coastal province (Beijing, Jiangsu, or Guangdong) show a premium for living along the coast in all enterprises except the FIEs in both years. A comparison of the coefficients over time suggests an increasing “coastal



premium” for the SOEs and UCEs, and a slightly decreasing premium for the PIEs.

## V. Oaxaca-Blinder Decompositions

In order to analyze the earnings differentials between individuals belonging to different enterprises, we first use the Oaxaca-Blinder method (Blinder 1973; Oaxaca 1973) to decompose the mean differences in log earnings into two components: one attributable to the differences in the mean endowments of workers across ownership, and one attributable to the differences in returns to these endowments.

The observed difference in average log earnings between two enterprises of different ownership,  $r_1$  and  $r_2$ , can be defined as:

$$\Delta \bar{w}_{r_1 r_2} = \bar{w}_{r_1} - \bar{w}_{r_2} \quad (2)$$

where the bars indicate the mean values. Substituting Equation (1) for Equation (2) yields:

$$\Delta \bar{w}_{r_1 r_2} = \bar{X}'_{r_1} \hat{\beta}_{r_1} - \bar{X}'_{r_2} \hat{\beta}_{r_2} \quad (3)$$

where the hats denote the estimated coefficients from the separate earnings equations.

Assuming that a non-discriminatory wage structure  $\beta^*$  is known, the log wage differential can be decomposed in the following way (Neumark 1988):

$$\Delta \bar{w}_{r_1 r_2} = (\bar{X}'_{r_1} - \bar{X}'_{r_2})' \beta^* + [\bar{X}'_{r_1} (\hat{\beta}_{r_1} - \beta^*) - \bar{X}'_{r_2} (\hat{\beta}_{r_2} - \beta^*)] \quad (4)$$

Equation (4) shows that the earnings gap between ownership  $r_1$  and ownership  $r_2$  can be decomposed into two parts. The first term can be interpreted as the part of the log earnings differential due to differences in average individual characteristics between different ownerships. This measures how much individuals in ownership  $r_1$  would earn if they had the same characteristics as those in ownership  $r_2$ . The second term represents the amount by which earnings in two different ownerships differ from the assumed non-discriminatory wage structure. It is the “unexplained” or residual component of the earnings gap. This effect may be due to either segmentation or to different productivity levels. In other words, the fact that

individuals with the same characteristics are paid differently in firms of different ownership might be due to different production processes that result in a different individual productivity across ownership, or to particular institutional factors, such as monopolistic power that leads to the return gap. There are several ways of constructing the assumed non-discriminatory wage structure  $\beta^*$  (Jann 2008). In the following, we present decompositions using the method proposed by Neumark (1988), which assumes a pooled wage structure (including a group indicator as suggested by Jann [2008]) as the non-discriminatory wage structure.

Table 9.6 reports the changes in relative remuneration across enterprises of different ownership in urban China by applying the Oaxaca-Blinder decomposition method separately for 2002 and for 2007. The table presents the mean predictions by ownership group, their difference, and the decomposition of the difference into explained and unexplained parts (expressed in both mean value and in percentage of the mean difference).

< Insert Table 9.6 about here >

The top panel in Table 9.6 shows the log hourly earnings decomposition results by ownership for 2002. The earnings gaps are rather large, especially between the public sector and the PIEs, as well as between the FIEs and the PIEs. In addition, except for the gap between the SOEs and the FIEs, all ownership differences are significantly different from zero. The results of the decomposition reveal that differences in endowment account for a rather small share of the earnings gap for all pairs of sectors, except for the UCE-PIE and PIE-FIE pairs. Hence, in 2002 the unexplained part accounted for most of the observed difference, thereby corroborating the findings by Démurger et al. (2006) that show the segmentation effect across ownership is fairly serious in urban China. The most striking example of such segmentation can be observed within the public sector: differences in endowments between SOEs and GAIs are negligible and the 27 percent earnings gap is entirely due to the “unexplained” component, which probably reflects the very strong

institutional protection of workers in GAIs at the turn of the century (Démurger et al. 2006). The same applies between the GAIs and FIEs, the former clearly appearing to be a protected sector as compared to the foreign sector.

Compared to 2002, the log hourly earnings gaps across ownership in 2007 were substantially reduced for all pairs of sectors, except for between SOEs and FIEs and for between GAIs and FIEs, for which the gap turned significantly in favor of FIEs. The evolution was generally in favor of both the private and semi-public sectors (PIEs, FIEs, and UCEs), and at the expense of the public sector, mostly the GAIs that had gained substantially during the 1995-2002 period. As already observed in the descriptive part of this chapter, the trend during the 2002-7 period was toward a rebalancing between the different ownerships.

The pattern of decomposition across ownership also changed remarkably between 2002 and 2007, with a striking reversal in the contributions of the explained and unexplained parts in the earnings differentials. Differences in endowment gained importance in accounting for the earnings gaps in 2007 as well as for the general decreasing trend in the earnings differences across ownership, whereas segmentation began to be less important.

The decomposition analysis presented in Table 9.6 highlights three main phenomena on the ownership dimension that are important to understand the recent evolution of the labor market in urban China. First, urban collectives and private enterprises, as compared to the public sector, saw their relative position improve dramatically. Indeed, compared to both SOEs and GAIs, the huge decrease in the earnings gap came from two concomitant forces: a convergence in endowments on the one hand, and a sharp reduction of segmentation against UCEs and PIEs on the other. This change is important in the sense that it signals an unprecedented better integration of the domestic sectors -- public, semi-public, and private.

Second, although the dominant position of GAIs declined between 2002 and 2007, the still comparatively higher wages in GAIs may be attributed to the employees' better

endowments as compared to those in other sectors. This is especially the case when compared to UCEs and PIEs: differences in endowments account for 50 percent and 67 percent of the earnings gap with GAIs in 2007, whereas these shares were only 12 percent and 28 percent respectively in 2002. That is, the strong increase in segmentation in favor of GAIs that was observed in the early 2000s (Démurger et al. 2006) vanished in the more recent period, both in absolute terms and as a share of the log earnings differences, which may indicate a trend toward less protection of earnings in the public sector.

Third, the foreign sector continued to reinforce its position through both better characteristics and more pronounced segmentation, especially compared to the public sector. Interestingly, the sharp increase in the earnings gap between SOEs and FIEs (in favor of the latter) between 2002 and 2007 was due to both diverging characteristics (that explain almost half the gap in 2007) and increasing segmentation. In 2007, if there were no differences in characteristics between SOEs and FIEs, the premium for FIEs would be 13 percent. A premium of a similar magnitude due to the “unexplained” part applies to the difference with GAIs, which explains the entire gap since the characteristics of workers in FIEs and GAIs are very similar. Finally, compared with UCEs and PIEs, the position of FIEs did not change considerably: both the better characteristics in FIEs and the rather strong segmentation contributed almost equally to the still important earnings gaps of 37 percent with UCEs and 47 percent with PIEs.

## **VI. Juhn-Murphy-Pierce Decomposition**

The Oaxaca-Blinder decomposition approach deals only with the mean of the distribution and it ignores differences along the distribution, for instance its dispersion or skewness. However, as shown in Section III, the distribution of hourly earnings differs across sectors. Hence, to complement the Oaxaca-Blinder decomposition, we use the decomposition technique

proposed by Juhn, Murphy, and Pierce (1993) that takes into account the entire earnings distribution.

The Juhn-Murphy-Pierce decomposition method extends the Oaxaca-Blinder approach by accounting for the residual distribution so that the hourly earnings gap can be decomposed into three parts: the individual characteristics effect (resulting from a change in the distribution of the  $X$ s), the return or “price” effect (resulting from a change in the  $\beta$ s), and the residual effect (or the influence of the unobservable factors).

Following Juhn, Murphy, and Pierce (1993), the residual  $u_{ir}$  in Equation (1) can be written as follows:

$$u_{ir} = F_r^{-1}(\theta_{ir} | X_{ir}) \quad (5)$$

where  $\theta_{ir}$  is the percentile of an individual in the residual distribution, and  $F_r$  is the cumulative distribution function of the earnings equation residuals (for individuals with characteristics  $X_{ir}$  in ownership  $r$ ).

Assuming that  $F^*$  is a reference residual distribution and  $\beta^*$  is a reference wage structure,<sup>12</sup> two hypothetical hourly earnings distributions can be created as follows:

$$w_{ir_1}^1 = \beta^* X_{ir_1} + F^{*-1}(\theta_{ir_1} | X_{ir_1}) \quad (6)$$

$$w_{ir_1}^2 = \beta^{r_1} X_{ir_1} + F^{*-1}(\theta_{ir_1} | X_{ir_1}) \quad (7)$$

The first hypothetical set of wages given in Equation (6) is computed by valuing each worker’s characteristics  $X_{ir_1}$  in sector  $r_1$  at the reference wage structure  $\beta^*$  and her position in sector  $r_1$ ’s residual distribution at the corresponding position in the reference residual distribution  $F^*$ . The second hypothetical distribution for sector  $r_1$  given in Equation (7) results from giving each worker her own estimated returns to characteristics  $\beta^{r_1}$  but the reference residual distribution  $F^*$ .

A main feature of the Juhn-Murphy-Pierce decomposition approach is that it allows for

an analysis over the entire earnings distribution. If the notation  $\tilde{w}$  indicates a summary statistic of the distribution of the corresponding variable, one can then write the following decomposition of the log earnings difference between two enterprises of different ownership,  $r_1$  and  $r_2$ :

$$\tilde{w}_{r_1} - \tilde{w}_{r_2} = \tilde{w}_{r_1}^1 - \tilde{w}_{r_2}^1 + [(\tilde{w}_{r_1}^2 - \tilde{w}_{r_2}^2) - (\tilde{w}_{r_1}^1 - \tilde{w}_{r_2}^1)] + [(\tilde{w}_{r_1} - \tilde{w}_{r_2}) - (\tilde{w}_{r_1}^2 - \tilde{w}_{r_2}^2)] \quad (8)$$

Given the definitions above, the first right-hand side term simply reflects the individual characteristics effect, or the difference in observable quantities between the two sectors. The second term (in brackets) represents the return effect, or the difference in observable prices, and the third term represents the residual effect, expressed by the difference of the two sectors' residual distribution.

< Insert Figure 9.3 about here >

The results of Juhn-Murphy-Pierce decompositions for each ownership pair are displayed in Figure 9.3. Each subfigure presents the earnings gap as well as its decomposition for an ownership pair at various percentiles: 5<sup>th</sup>, 10<sup>th</sup>, 25<sup>th</sup>, 50<sup>th</sup>, 75<sup>th</sup>, 90<sup>th</sup>, and 95<sup>th</sup>. Four main observations can be drawn from these figures.

First, the distribution of the earnings gaps varies markedly across ownership pairs. A comparison of any ownership with the domestic private sector (that is, the following pairs: SOEs-PIEs, GAIs-PIEs, UCEs-PIEs, and FIEs-PIES) shows that the largest gap occurs at the bottom of the distribution but it almost vanishes at the top of the distribution in both 2002 and 2007. This means that the significant average earnings gaps observed between these categories of ownership are mainly due to individuals in the bottom 5-10 percentile, with the private sector paying much less than any other category. However, the pattern is completely reversed when comparing UCEs and FIEs in 2002: the earnings gap for the lowest wage-earners is fairly small but it increases significantly when moving up the income distribution. This trend reflects the patterns observed in Figure 9.2, with “high-wage” earners

in the foreign sector receiving much higher remuneration than “high-wage” earners in the semi-public sector in 2002. Finally, the profile for the earning gaps between SOEs and UCEs, between GAIs and UCEs, as well as between SOEs and GAIs is rather flat in 2002. This indicates comparatively fairly equal distributions of the earnings gaps in the public and semi-public sectors, as the difference between the top and bottom percentiles is not substantial.

Second, the decomposition of the earnings gaps confirms that individual endowments explain only a small share of the observed gaps within the public and semi-public sectors (SOEs, GAIs, and UCEs), whereas the segmentation (or price) effect is the largest, with no significant variations across the distribution. When compared with the private sector, the quantity component becomes relatively more important, explaining about half the earnings difference between FIEs and UCEs and between FIEs and PIEs. Finally, the residual effect (unobserved factors) does not play any clear-cut role in explaining the earnings difference, except at the bottom of the distribution for the SOE-PIE, GAI-PIE, and UCE-PIE pairs.

Third, the comparison between SOEs and FIEs merits specific comment because the gap varies greatly over the earnings distribution and important changes occurred over time. In 2002, SOEs were paying comparatively higher average wages to the lowest wage-earners, whereas FIEs were offering higher wages to the 75<sup>th</sup> percentile, thereby changing the sign over the distribution (and possibly explaining why the mean difference reported in Table 9.6 is not significant). Interestingly, although the gap in favor of SOEs at the bottom of the distribution appears to be explained equally by differences in quantity, price, and residuals, the gap in favor of FIEs at the top of the distribution is mainly explained by different remuneration characteristics (that more than compensate for the better characteristics of SOE workers).

Fourth, as previously discussed, earnings differentials were substantially reduced between

2002 and 2007 for almost all pairs of sectors. Whole distributions provide a more complete view of this average evolution by highlighting some differences along the earnings distribution. Hence, the reduction in the earnings gap tends to be more pronounced at the bottom of the distribution, due to the decreasing segmentation. This is particularly the case for the SOE-GAI and UCE-GAI pairs, suggesting that in the public sector, the wage structure has become more harmonized for low wage-earners. In addition, distribution patterns for different ownerships at various percentiles changed considerably, suggesting that wage-setting mechanisms experienced major changes during this period. In this respect, the foreign sector exhibits particularly interesting changes. Indeed, the position of FIEs clearly improved relative to both SOEs and GAIs, with the gap in 2007 fully favoring the FIEs over the whole distribution, and with very clear differences at the top of the distribution, almost fully explained by segmentation in favor of FIEs. This probably reflects a proactive strategy by FIEs toward high wage-earners (this was already visible in 2002, although it was less clear-cut). Interestingly, the smallest earnings differential for the FIE-SOE and FIE-GAI pairs is around the 25<sup>th</sup> percentile, which indicates that for individuals below the median, wages across these ownerships are quite similar. Finally, the 2007 figures also indicate that segmentation still played a fairly important role in explaining earnings gaps across ownership, with a particularly pronounced importance at the top of the distribution.

## **VII. Conclusions**

This chapter analyzes wage inequality trends across ownership during the 2002-7 period and investigates the reasons for the gap by decomposing the difference in mean wages using the Oaxaca-Blinder technique and analyzing the wage-gap distribution using the Juhn-Murphy-Pierce decomposition method.

We find that although average earnings gaps were still fairly large across ownership



sectors in 2002, they decreased by 2007. Moreover, the observed earnings convergence took place in favor of the private and semi-public sectors, as opposed to the public sector. In terms of earnings differentials across the distribution, the Juhn-Murphy-Pierce decomposition highlights a comparatively fairly equal distribution within the public sector, whereas most of the gap for the private domestic sector came from the bottom of the distribution. As for foreign-invested enterprises, the clear improvement in their position with regard to the public sector (SOEs and GAIs) between 2002 and 2007 is observable across the entire distribution, implying that workers in foreign-invested firms benefited from the improved position of these enterprises.

The Oaxaca-Blinder and Juhn-Murphy-Pierce decompositions both show that differences in endowments gained importance over time in accounting for the earnings gaps as well as for the generally decreasing trend in earnings differences across ownership. However, segmentation was less important in 2007 as compared to 2002. Indeed, our results highlight a better integration of the domestic sectors over time. They also show that segmentation in favor of GAIs, which was fairly strong in 2002, vanished over time, although not throughout the entire distribution. In particular, the Juhn-Murphy-Pierce decompositions indicate that segmentation remained important for high wage-earners, as compared to workers at the bottom of the distribution, suggesting that workers at the top of the distribution were still benefiting from some protection.

## References

- Adamchick, V. A. and A. S. Bedi (2000), "Wage Differentials between the Public and the Private Sectors: Evidence from an Economy in Transition," *Labour Economics*, 7(2), 203-224.
- Blinder, A. S. (1973), "Wage Discrimination: Reduced Form and Structural Estimates," *Journal of Human Resources*, 8(4), 436-455.
- Boeri, T. and K. Terrell (2002), "Institutional Determinants of Labor Reallocation in Transition," *Journal of Economic Perspectives*, 16(1), 51-76.
- Brandt, L. and C. A. Holz (2006), "Spatial Price Differences in China: Estimates and Implications," *Economic Development and Cultural Change*, 55(1), 43-86.
- Card, D. (1999), "The Causal Effect of Education on Earnings," in O. Ashenfelter and D. Card, eds., *Handbook of Labor Economics*, 1801-1863, Amsterdam: North-Holland.
- Chen, Y., S. Démurger, and M. Fournier (2005), "Earnings Differentials and Ownership Structure in Chinese Enterprises," *Economic Development and Cultural Change*, 53(4), 933-958.
- Démurger, S., M. Fournier, and Y. Chen (2007), "The Evolution of Gender Earnings Gaps and Discrimination in Urban China, 1988-95," *Developing Economies*, 45(1), 97-121.
- Démurger, S., M. Fournier, S. Li, and Z. Wei (2006), "Economic Liberalization with Rising Segmentation in China's Urban Labor Market," *Asian Economic Papers*, 5(3), 58-103.
- Dong, X. and P. Bowles (2002), "Segmentation and Discrimination in China's Emerging Industrial Labor Market," *China Economic Review*, 13(2-3), 170-196.
- Falaris, E. M. (2004), "Private and Public Sector Wages in Bulgaria," *Journal of Comparative Economics*, 32(1), 56-72.
- Jann, B. (2008), "A Stata Implementation of the Blinder-Oaxaca Decomposition," ETH Zurich Sociology Working Paper 5, ETH Zurich.
- Juhn, C., K.M. Murphy, and B. Pierce (1993), "Wage Inequality and the Rise in Returns to Skill," *Journal of Political Economy*, 101(3), 410-442.
- Knight, J. and L. Song (2003), "Increasing Urban Wage Inequality in China: Extent, Elements and Evaluation," *Economics of Transition*, 11(4), 597-619.
- Knight, J. and L. Song (2005), *Towards a Labour Market in China*, Oxford: Oxford University Press.
- Lardy N. R. (1998), *China's Unfinished Economic Revolution*, Washington, DC: Brookings Institution.

Li, S. and J. Song (2010), “Changes in Gender Wage Gap in Urban China during 1995-2007,” University of Chicago and Renmin University of China International Symposium on Family and Labor Economics, September.

Lokshin, M. M. and B. Jovanovic (2003), “Wage Differentials and State-Private Sector Employment Choice in Yugoslavia,” *Economics of Transition*, 11(3), 463–491.

Maurer-Fazio, M., T. G. Rawski, and W. Zhang (1999), “Inequality in the Rewards for Holding Up Half the Sky: Gender Wage Gaps in China’s Urban Labour Market, 1988–1994,” *China Journal*, no. 41, 55–88.

Meng, X. and J. Zhang (2001), “The Two-Tier Labor Market in Urban China: Occupational Segregation and Wage Differentials between Urban Residents and Rural Migrants in Shanghai,” *Journal of Comparative Economics*, 29(3), 485-504.

Mincer, J. (1974), *Schooling, Experience, and Earnings*, New York: National Bureau of Economic Research.

National Bureau of Statistics (NBS) (2008), *Zhongguo tongji nianjian 2008* (China Statistical Yearbook 2008), Beijing: Zhongguo tongji chubanshe.

Naughton, B. (2007), *The Chinese Economy: Transitions and Growth*, Cambridge, MA: The MIT Press.

Neumark, D. (1988), “Employers’ Discriminatory Behavior and the Estimation of Wage Discrimination,” *Journal of Human Resources*, 23(3), 279-295.

Oaxaca, R. (1973), “Male-Female Wage Differentials in Urban Labor Markets,” *International Economic Review*, 14(3), 693-709.

Su, X. (1999), *Xin Zhongguo jingji shi* (Economic History of New China), Beijing: Zhonggong zhongyang dangxiao chubanshe.

Wang, M. (2005), *China Human Development Report: Toward Human Development with Equity*, Beijing: UNDP and China Development Research Foundation.

Xing, C. (2008), “Human Capital and Wage Determination in Different Ownerships, 1989–97,” in Wan Guanghua, ed., *Understanding Inequality and Poverty in China: Methods and Applications*, 117-136, New York: Palgrave Macmillan.

Zhao, Y. (2002), “Earnings Differentials Between State and Non-state Enterprises in Urban China,” *Pacific Economic Review*, 7(1), 181-197.

Table 9.1. *Definition of ownership categories*

| <i>Public versus private groups</i> | <i>Ownership categories</i>                 | <i>Types included</i>  |
|-------------------------------------|---|--|
| Public sector                       | State-owned enterprises (SOEs)              | Solely state owned enterprises;<br>State holding enterprises;<br>State holding joint ventures.   |
|                                     | Government agencies and institutions (GAIs) | Government agencies and Party agencies (including the Party Committee, Government, People's Congress, the Chinese People's Political Consultative Conference (CPPCC), public security organs & procurator's offices & courts, the military);<br>State and collective institutions;<br>Civilian-run enterprises and public service units. |
| Semi-public sector                  | Urban collective enterprises (UCEs)         | Solely collective owned enterprises;<br>Collective holding enterprises;<br>Collective holding joint ventures.  |
| Private sector                      | Private and individual enterprises (PIEs)   | Solely private owned enterprises;<br>Private holding enterprises;<br>Private holding joint ventures;<br>Self-employed individuals.   |
|                                     | Foreign-invested enterprises (FIEs)         | Solely foreign owned enterprises;<br>Foreign holding joint ventures.   |

*Source:* 2007 CHIP urban survey questionnaire.

*Note:* If the answer given by the respondent is "Other enterprise," then it is not attributed to any of the above categories and is simply dropped.

Table 9.2. *Descriptive statistics on individual characteristics by ownership*

| <b>2002</b>                  | <b>SOEs</b>      | <b>GAIs</b>      | <b>UCEs</b>      | <b>PIEs</b>      | <b>FIEs</b>      | <b>All</b>       |
|------------------------------|------------------|------------------|------------------|------------------|------------------|------------------|
| Male                         | 0.595<br>(0.491) | 0.551<br>(0.498) | 0.440<br>(0.497) | 0.549<br>(0.498) | 0.567<br>(0.497) | 0.558<br>(0.497) |
| Age                          | 40.86<br>(8.505) | 40.46<br>(8.914) | 41.44<br>(8.178) | 39.11<br>(8.666) | 35.85<br>(8.923) | 40.24<br>(8.716) |
| Education                    | 11.17<br>(2.702) | 12.69<br>(2.872) | 10.13<br>(2.471) | 10.14<br>(2.853) | 11.96<br>(2.665) | 11.34<br>(2.957) |
| Experience in<br>current job | 17.71<br>(9.383) | 14.43<br>(9.214) | 16.25<br>(9.380) | 10.45<br>(9.335) | 10.46<br>(8.417) | 14.65<br>(9.722) |
| Training                     | 0.283<br>(0.451) | 0.327<br>(0.469) | 0.239<br>(0.427) | 0.198<br>(0.398) | 0.276<br>(0.449) | 0.273<br>(0.445) |
| Coast                        | 0.308<br>(0.462) | 0.294<br>(0.456) | 0.450<br>(0.498) | 0.363<br>(0.481) | 0.504<br>(0.502) | 0.332<br>(0.471) |
| Capital city                 | 0.348<br>(0.476) | 0.305<br>(0.461) | 0.232<br>(0.422) | 0.236<br>(0.425) | 0.488<br>(0.502) | 0.302<br>(0.459) |
| Company size                 | 2.912<br>(1.129) | 1.793<br>(1.013) | 1.919<br>(0.968) | 1.752<br>(1.069) | 2.709<br>(1.062) | 2.204<br>(1.194) |
| Observations                 | 1896             | 1698             | 393              | 1316             | 127              | 5430             |
| <i>% of total</i>            | 34.92            | 31.27            | 7.24             | 24.24            | 2.34             | 100.00           |
| <b>2007</b>                  | <b>SOEs</b>      | <b>GAIs</b>      | <b>UCEs</b>      | <b>PIEs</b>      | <b>FIEs</b>      | <b>All</b>       |
| Male                         | 0.615<br>(0.487) | 0.570<br>(0.495) | 0.537<br>(0.500) | 0.555<br>(0.497) | 0.558<br>(0.498) | 0.571<br>(0.495) |
| Age                          | 40.56<br>(9.258) | 40.59<br>(9.332) | 39.52<br>(9.118) | 37.93<br>(9.236) | 34.17<br>(7.748) | 39.43<br>(9.353) |
| Education                    | 12.14<br>(3.032) | 12.99<br>(3.076) | 11.78<br>(3.116) | 11.30<br>(3.232) | 13.39<br>(3.211) | 12.22<br>(3.215) |
| Experience in<br>current job | 16.99<br>(10.72) | 14.85<br>(10.63) | 12.48<br>(10.19) | 8.606<br>(8.115) | 8.628<br>(7.126) | 12.85<br>(10.32) |
| Training                     | 0.442<br>(0.497) | 0.425<br>(0.494) | 0.326<br>(0.470) | 0.275<br>(0.447) | 0.407<br>(0.493) | 0.372<br>(0.484) |
| Coast                        | 0.248<br>(0.432) | 0.321<br>(0.467) | 0.389<br>(0.488) | 0.398<br>(0.490) | 0.628<br>(0.485) | 0.347<br>(0.476) |
| Capital city                 | 0.673<br>(0.469) | 0.664<br>(0.473) | 0.646<br>(0.479) | 0.606<br>(0.489) | 0.512<br>(0.501) | 0.640<br>(0.480) |
| Company size                 | 2.531<br>(1.208) | 1.858<br>(1.082) | 1.800<br>(1.013) | 1.358<br>(0.783) | 2.145<br>(1.227) | 1.827<br>(1.102) |
| Observations                 | 949              | 1968             | 285              | 1655             | 172              | 5029             |
| <i>% of total</i>            | 18.87            | 39.13            | 5.67             | 32.91            | 3.42             | 100.00           |

*Source:* Authors' calculations using the 2002 CHIP and the 2007 CHIP survey data, urban sample, 7 provinces, with  $16 \leq \text{age} \leq 60$  for men and  $16 \leq \text{age} \leq 55$  for women, full-time employment, and earning positive wages.

*Note:* Ownership categories are state-owned enterprises (SOEs), government agencies or institutions (GAIs), urban collective enterprises (UCEs), private or individual enterprises (PIEs), and foreign-invested enterprises (FIEs). "Male," "Training," "Coast," and "Capital city" are dummy variables for being a male, having received training, living in a coastal city, and living in a provincial capital city respectively. "Education" measures the number of years of education received. "Experience in current job" refers to the number of years in the current

occupation. “Company size” measures the number of employees in the company and is grouped by 4 ranks (following the 2002 CHIP), 1 represents 1-100 employees; 2 represents 101-500 employees; 3 represents 501-1000 employees; and 4 represents 1,000 employees or more.

Table 9.3. *Descriptive statistics on individual earnings by ownership*

| <b>2002</b>                    | <b>SOEs</b>          | <b>GAI</b> s          | <b>UCE</b> s          | <b>PIE</b> s         | <b>FIE</b> s          | <b>All</b>            |
|--------------------------------|----------------------|-----------------------|-----------------------|----------------------|-----------------------|-----------------------|
| Total year income              | 11261.6<br>(7352.8)  | 14221.1<br>(7992.0)   | 8108.8<br>(4880.5)    | 9270.9<br>(9157.6)   | 12907.7<br>(9617.8)   | 11514.9<br>(8211.9)   |
| <i>Gap to average earnings</i> | 0,98                 | 1,24                  | 0,70                  | 0,81                 | 1,12                  |                       |
| <i>Gini coefficient</i>        | 0.307                | 0.290                 | 0.293                 | 0.386                | 0.324                 | 0.336                 |
| Working hours/week             | 42.30<br>(7.972)     | 41.23<br>(8.060)      | 44.38<br>(10.39)      | 51.94<br>(15.63)     | 45.34<br>(11.61)      | 44.52<br>(11.45)      |
| Hourly wage                    | 5.380<br>(4.375)     | 7.086<br>(6.096)      | 3.710<br>(2.444)      | 3.851<br>(4.819)     | 5.877<br>(4.836)      | 5.434<br>(5.155)      |
| <i>Gap to average earnings</i> | 0,99                 | 1,30                  | 0,68                  | 0,71                 | 1,08                  |                       |
| <i>Gini coefficient</i>        | 0.334                | 0.328                 | 0.322                 | 0.430                | 0.361                 | 0.377                 |
| Observations                   | 1896                 | 1698                  | 393                   | 1316                 | 127                   | 5430                  |
| <b>2007</b>                    | <b>SOEs</b>          | <b>GAI</b> s          | <b>UCE</b> s          | <b>PIE</b> s         | <b>FIE</b> s          | <b>All</b>            |
| Total year income              | 21614.6<br>(18204.8) | 23096.0<br>(16235.1 ) | 18897.0<br>(12956.8 ) | 20492.2<br>(27264.2) | 27455.7<br>(19755.7 ) | 21870.7<br>(20872.9 ) |
| <i>Gap to average earnings</i> | 0,99                 | 1,06                  | 0,86                  | 0,94                 | 1,26                  |                       |
| <i>Gini coefficient</i>        | 0.341                | 0.338                 | 0.337                 | 0.408                | 0.366                 | 0.367                 |
| <i>2002-7 growth rate</i>      | 92%                  | 62%                   | 133%                  | 121%                 | 113%                  | 90%                   |
| Working hours/week             | 43.24<br>(9.682)     | 42.19<br>(19.21)      | 44.65<br>(10.24)      | 49.87<br>(22.32)     | 42.61<br>(7.716)      | 45.07<br>(18.59)      |
| Hourly wage                    | 10.13<br>(9.031)     | 11.58<br>(11.01)      | 8.826<br>(6.914)      | 8.947<br>(11.56)     | 12.81<br>(9.277)      | 10.33<br>(10.68)      |
| <i>Gap to average earnings</i> | 0,98                 | 1,12                  | 0,85                  | 0,87                 | 1,24                  |                       |
| <i>Gini coefficient</i>        | 0.364                | 0.378                 | 0.375                 | 0.449                | 0.375                 | 0.405                 |
| <i>2002-7 growth rate</i>      | 88%                  | 63%                   | 138%                  | 132%                 | 118%                  | 90%                   |
| Observations                   | 949                  | 1968                  | 285                   | 1655                 | 172                   | 5029                  |

*Source:* See Table 9.2.

*Notes:* Earnings are deflated using the urban provincial-level spatial price deflators calculated by Brandt and Holz (2006), and updated for 2007. Base: Nationwide prices in 2002.

Table 9.4. *Hourly wage functions by ownership, 2002*

|                              | (1)<br><b>SOEs</b>                  | (2)<br><b>GAI</b> s                 | (3)<br><b>UCE</b> s              | (4)<br><b>PIE</b> s                 | (5)<br><b>FIE</b> s              |
|------------------------------|-------------------------------------|-------------------------------------|----------------------------------|-------------------------------------|----------------------------------|
| Male                         | 0.104 <sup>***</sup><br>(0.000)     | 0.0700 <sup>**</sup><br>(0.012)     | 0.122 <sup>**</sup><br>(0.041)   | 0.219 <sup>***</sup><br>(0.000)     | 0.145<br>(0.201)                 |
| Education                    | 0.0621 <sup>***</sup><br>(0.000)    | 0.0657 <sup>***</sup><br>(0.000)    | 0.0564 <sup>***</sup><br>(0.000) | 0.0759 <sup>***</sup><br>(0.000)    | 0.0857 <sup>***</sup><br>(0.000) |
| Experience                   | 0.0370 <sup>***</sup><br>(0.000)    | 0.0422 <sup>***</sup><br>(0.000)    | 0.0226<br>(0.116)                | 0.0380 <sup>***</sup><br>(0.000)    | 0.0207<br>(0.365)                |
| Experience <sup>2</sup>      | -0.000591 <sup>***</sup><br>(0.000) | -0.000705 <sup>***</sup><br>(0.000) | -0.000391<br>(0.158)             | -0.000631 <sup>***</sup><br>(0.001) | -0.000223<br>(0.679)             |
| Experience in<br>current job | 0.00316<br>(0.147)                  | 0.0128 <sup>**</sup><br>(0.000)     | 0.00107<br>(0.761)               | 0.0127 <sup>**</sup><br>(0.000)     | 0.00898<br>(0.204)               |
| Training                     | 0.200 <sup>***</sup><br>(0.000)     | 0.0390<br>(0.191)                   | 0.0914<br>(0.164)                | 0.0759<br>(0.252)                   | 0.195<br>(0.179)                 |
| Coast                        | 0.215 <sup>***</sup><br>(0.000)     | 0.338 <sup>***</sup><br>(0.000)     | 0.161 <sup>***</sup><br>(0.007)  | 0.423 <sup>***</sup><br>(0.000)     | 0.159<br>(0.225)                 |
| Capital city                 | 0.200 <sup>***</sup><br>(0.000)     | 0.0362<br>(0.225)                   | 0.314 <sup>***</sup><br>(0.000)  | 0.264 <sup>***</sup><br>(0.000)     | 0.0702<br>(0.600)                |
| Company size                 | 0.0354 <sup>***</sup><br>(0.003)    | 0.0430 <sup>***</sup><br>(0.001)    | 0.0287<br>(0.262)                | 0.128 <sup>***</sup><br>(0.000)     | 0.116 <sup>**</sup><br>(0.021)   |
| Constant                     | -0.108<br>(0.315)                   | -0.00987<br>(0.929)                 | -0.0149<br>(0.949)               | -0.982 <sup>***</sup><br>(0.000)    | -0.413<br>(0.263)                |
| <i>N</i>                     | 1896                                | 1698                                | 393                              | 1316                                | 127                              |
| <i>R</i> <sup>2</sup>        | 0.194                               | 0.256                               | 0.156                            | 0.205                               | 0.219                            |

*Source:* See Table 9.2.

*Notes:* See Table 9.2. *p*-values in parentheses. \*  $p < 0.10$ , \*\*  $p < 0.05$ , and \*\*\*  $p < 0.01$ . Earnings are deflated using the urban provincial-level spatial price deflators calculated by Brandt and Holz (2006), and updated for 2007. Base: Nationwide prices in 2002.



Table 9.5. *Hourly wage functions by ownership, 2007*

|                              | (1)<br><b>SOEs</b>                  | (2)<br><b>GAIs</b>                 | (3)<br><b>UCEs</b>               | (4)<br><b>PIEs</b>                  | (5)<br><b>FIEs</b>               |
|------------------------------|-------------------------------------|------------------------------------|----------------------------------|-------------------------------------|----------------------------------|
| Male                         | 0.195 <sup>***</sup><br>(0.000)     | 0.168 <sup>***</sup><br>(0.000)    | 0.212 <sup>***</sup><br>(0.005)  | 0.250 <sup>***</sup><br>(0.000)     | 0.0771<br>(0.407)                |
| Education                    | 0.0381 <sup>***</sup><br>(0.000)    | 0.0717 <sup>***</sup><br>(0.000)   | 0.0653 <sup>***</sup><br>(0.000) | 0.0500 <sup>***</sup><br>(0.000)    | 0.0904 <sup>***</sup><br>(0.000) |
| Experience                   | 0.0168 <sup>**</sup><br>(0.047)     | 0.0129 <sup>*</sup><br>(0.049)     | -0.00463<br>(0.748)              | 0.0137 <sup>**</sup><br>(0.031)     | 0.0174<br>(0.474)                |
| Experience <sup>2</sup>      | -0.000452 <sup>***</sup><br>(0.009) | -0.000352 <sup>**</sup><br>(0.014) | -0.00000205<br>(0.995)           | -0.000458 <sup>***</sup><br>(0.002) | -0.000617<br>(0.318)             |
| Experience in<br>current job | 0.00788 <sup>***</sup><br>(0.003)   | 0.0214 <sup>***</sup><br>(0.000)   | 0.00599<br>(0.187)               | 0.0126 <sup>***</sup><br>(0.000)    | 0.0336 <sup>***</sup><br>(0.000) |
| Training                     | 0.197 <sup>***</sup><br>(0.000)     | 0.0478<br>(0.119)                  | 0.118<br>(0.152)                 | 0.100 <sup>***</sup><br>(0.006)     | 0.102<br>(0.275)                 |
| Coast                        | 0.341 <sup>***</sup><br>(0.000)     | 0.337 <sup>***</sup><br>(0.000)    | 0.271 <sup>***</sup><br>(0.000)  | 0.384 <sup>***</sup><br>(0.000)     | 0.213 <sup>*</sup><br>(0.063)    |
| Capital city                 | 0.0770 <sup>*</sup><br>(0.079)      | 0.0629 <sup>**</sup><br>(0.036)    | 0.183 <sup>**</sup><br>(0.017)   | 0.184 <sup>***</sup><br>(0.000)     | -0.129<br>(0.206)                |
| Company size                 | 0.00609<br>(0.743)                  | 0.0359 <sup>**</sup><br>(0.012)    | 0.0294<br>(0.415)                | 0.0433 <sup>**</sup><br>(0.030)     | -0.0482<br>(0.201)               |
| Constant                     | 1.028 <sup>***</sup><br>(0.000)     | 0.540 <sup>***</sup><br>(0.000)    | 0.776 <sup>**</sup><br>(0.011)   | 0.650 <sup>***</sup><br>(0.000)     | 0.689<br>(0.125)                 |
| <i>N</i>                     | 948                                 | 1964                               | 285                              | 1652                                | 172                              |
| <i>R</i> <sup>2</sup>        | 0.136                               | 0.243                              | 0.212                            | 0.198                               | 0.336                            |

*Source:* See Table 9.2.

*Note:* See Table 9.4.

Table 9.6. *Oaxaca–Blinder decomposition of log hourly wages by ownership*

| <b>Year 2002</b> |                      |                      |                       |                       |                        |                       |        |      |
|------------------|----------------------|----------------------|-----------------------|-----------------------|------------------------|-----------------------|--------|------|
|                  | Average log earnings |                      | Difference (A-B)      | Decomposition         |                        |                       |        | N    |
|                  | Group A              | Group B              |                       | Explained Percentage  | Unexplained Percentage |                       |        |      |
| SOEs-GAIs        | 1.490***<br>(0.0141) | 1.762***<br>(0.0154) | -0.271***<br>(0.0209) | 0.0115<br>(0.0150)    | -4.2%                  | -0.283***<br>(0.0219) | 104.2% | 3594 |
| SOEs-UCEs        | 1.490***<br>(0.0141) | 1.139***<br>(0.0293) | 0.351***<br>(0.0325)  | 0.105***<br>(0.0182)  | 29.9%                  | 0.246***<br>(0.0324)  | 70.1%  | 2289 |
| SOEs-PIEs        | 1.490***<br>(0.0141) | 0.973***<br>(0.0266) | 0.517***<br>(0.0301)  | 0.256***<br>(0.0189)  | 49.5%                  | 0.261***<br>(0.0274)  | 50.5%  | 3212 |
| SOEs-FIEs        | 1.490***<br>(0.0141) | 1.547***<br>(0.0587) | -0.0566<br>(0.0604)   | -0.00777<br>(0.0262)  | 13.7%                  | -0.0488<br>(0.0556)   | 86.3%  | 2023 |
| GAIs-UCEs        | 1.762***<br>(0.0154) | 1.139***<br>(0.0293) | 0.622***<br>(0.0331)  | 0.0726***<br>(0.0200) | 11.7%                  | 0.550***<br>(0.0340)  | 88.3%  | 2091 |
| GAIs-PIEs        | 1.762***<br>(0.0154) | 0.973***<br>(0.0266) | 0.789***<br>(0.0307)  | 0.217***<br>(0.0194)  | 27.5%                  | 0.572***<br>(0.0307)  | 72.5%  | 3014 |
| GAIs-FIEs        | 1.762***<br>(0.0154) | 1.547***<br>(0.0587) | 0.215***<br>(0.0607)  | 0.0323<br>(0.0308)    | 15.0%                  | 0.183**<br>(0.0589)   | 85.0%  | 1825 |
| UCEs-PIEs        | 1.139***<br>(0.0293) | 0.973***<br>(0.0266) | 0.166***<br>(0.0396)  | 0.119***<br>(0.0242)  | 71.7%                  | 0.0473<br>(0.0369)    | 28.3%  | 1709 |
| UCEs-FIEs        | 1.139***<br>(0.0293) | 1.547***<br>(0.0588) | -0.408***<br>(0.0657) | -0.178***<br>(0.0428) | 43.6%                  | -0.230***<br>(0.0665) | 56.4%  | 520  |
| PIEs-FIEs        | 0.973***<br>(0.0266) | 1.547***<br>(0.0587) | -0.574***<br>(0.0645) | -0.334***<br>(0.0439) | 58.2%                  | -0.240***<br>(0.0607) | 41.8%  | 1443 |

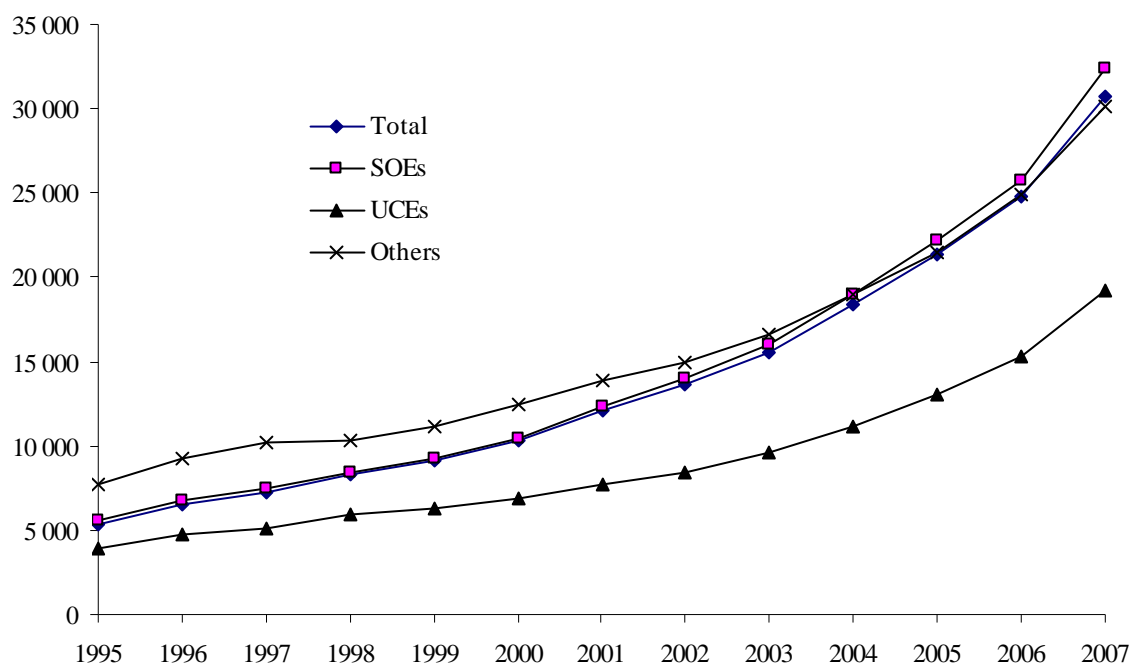
Table 9.6 (cont'). *Oaxaca–Blinder decomposition of log hourly wages by ownership***Year 2007**

|           | Average log earnings |                      | Difference (A-B)      | Decomposition         |            |                       |            | N    |
|-----------|----------------------|----------------------|-----------------------|-----------------------|------------|-----------------------|------------|------|
|           | Group A              | Group B              |                       | Explained             | Percentage | Unexplained           | Percentage |      |
| SOEs-GAIs | 2.081***<br>(0.0233) | 2.194***<br>(0.0162) | -0.113***<br>(0.0284) | -0.0121<br>(0.0157)   | 10.7%      | -0.101***<br>(0.0297) | 89.3%      | 2912 |
| SOEs-UCEs | 2.081***<br>(0.0233) | 1.946***<br>(0.0394) | 0.135**<br>(0.0458)   | 0.0496*<br>(0.0235)   | 36.7%      | 0.0854<br>(0.0461)    | 63.3%      | 1233 |
| SOEs-PIEs | 2.081***<br>(0.0233) | 1.846***<br>(0.0191) | 0.235***<br>(0.0301)  | 0.140***<br>(0.0237)  | 59.6%      | 0.0955**<br>(0.0349)  | 40.4%      | 2600 |
| SOEs-FIEs | 2.081***<br>(0.0233) | 2.312***<br>(0.0532) | -0.231***<br>(0.0581) | -0.0976**<br>(0.0333) | 42.3%      | -0.134*<br>(0.0598)   | 57.7%      | 1120 |
| GAIs-UCEs | 2.194***<br>(0.0162) | 1.946***<br>(0.0394) | 0.248***<br>(0.0426)  | 0.125***<br>(0.0223)  | 50.4%      | 0.123**<br>(0.0398)   | 49.6%      | 2249 |
| GAIs-PIEs | 2.194***<br>(0.0162) | 1.846***<br>(0.0191) | 0.348***<br>(0.0250)  | 0.232***<br>(0.0162)  | 66.7%      | 0.116***<br>(0.0244)  | 33.3%      | 3616 |
| GAIs-FIEs | 2.194***<br>(0.0162) | 2.312***<br>(0.0532) | -0.118*<br>(0.0556)   | -0.00764<br>(0.0308)  | 6.5%       | -0.111*<br>(0.0494)   | 93.5%      | 2136 |
| UCEs-PIEs | 1.946***<br>(0.0394) | 1.846***<br>(0.0191) | 0.100*<br>(0.0438)    | 0.0886***<br>(0.0229) | 88.6%      | 0.0114<br>(0.0406)    | 11.4%      | 1937 |
| UCEs-FIEs | 1.946***<br>(0.0394) | 2.312***<br>(0.0532) | -0.366***<br>(0.0663) | -0.180***<br>(0.0414) | 49.2%      | -0.186**<br>(0.0647)  | 50.8%      | 457  |
| PIEs-FIEs | 1.846***<br>(0.0191) | 2.312***<br>(0.0532) | -0.466***<br>(0.0565) | -0.254***<br>(0.0319) | 54.5%      | -0.212***<br>(0.0528) | 45.5%      | 1824 |

Source: See Table 9.2.

Notes: See Table 9.2. Standard errors in parentheses. \*  $p < 0.05$ , \*\*  $p < 0.01$ , and \*\*\*  $p < 0.001$ . Decompositions based on regression results are presented in Tables 9.4 and 9.5. Earnings are deflated using the urban provincial-level spatial price deflators calculated by Brandt and Holz (2006), and updated for 2007. Base: Nationwide prices in 2002.

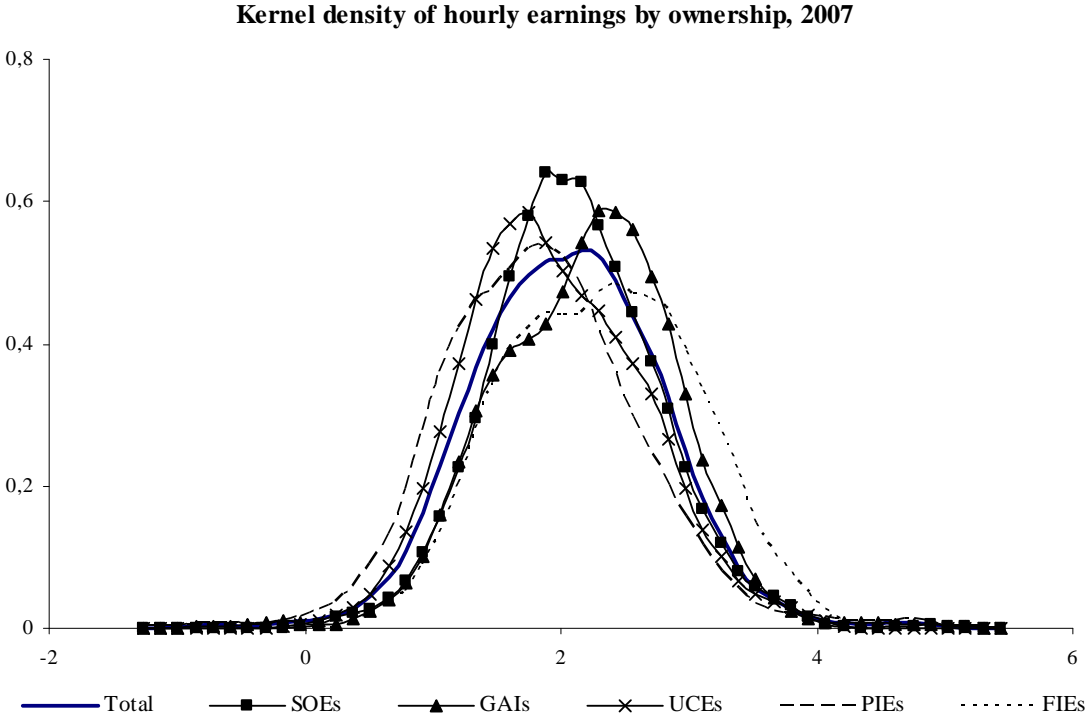
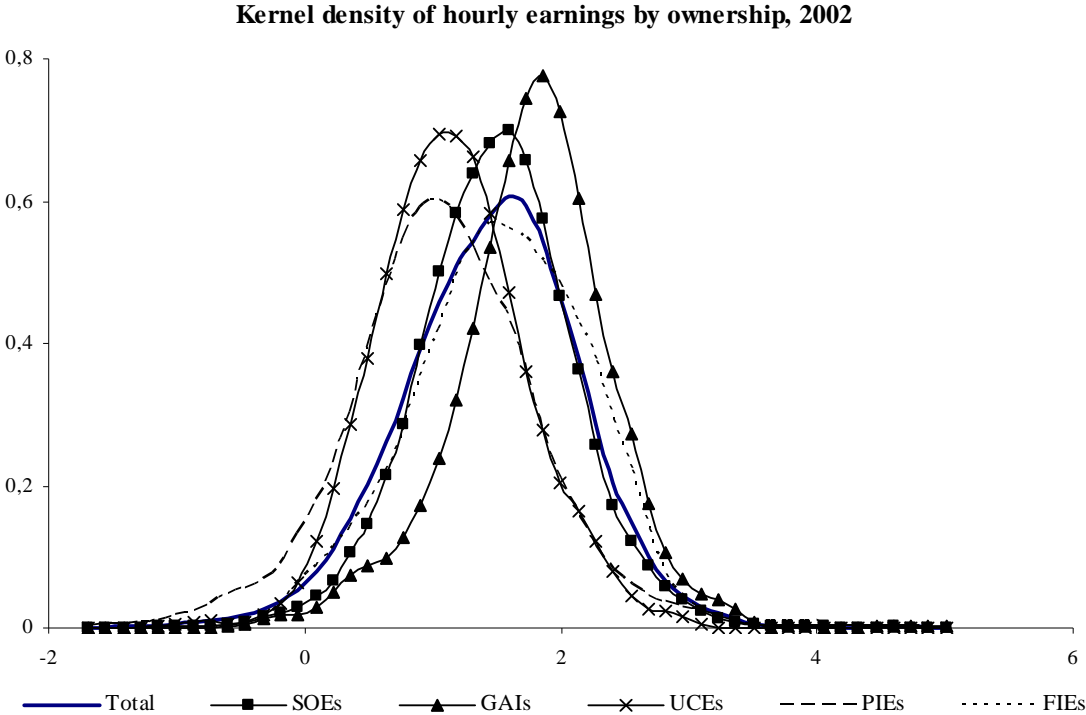
Figure 9.1 Average Annual Real Wage Trend for Public and Private Sectors, 1995-2007



Source: National Bureau of Statistics (2008).

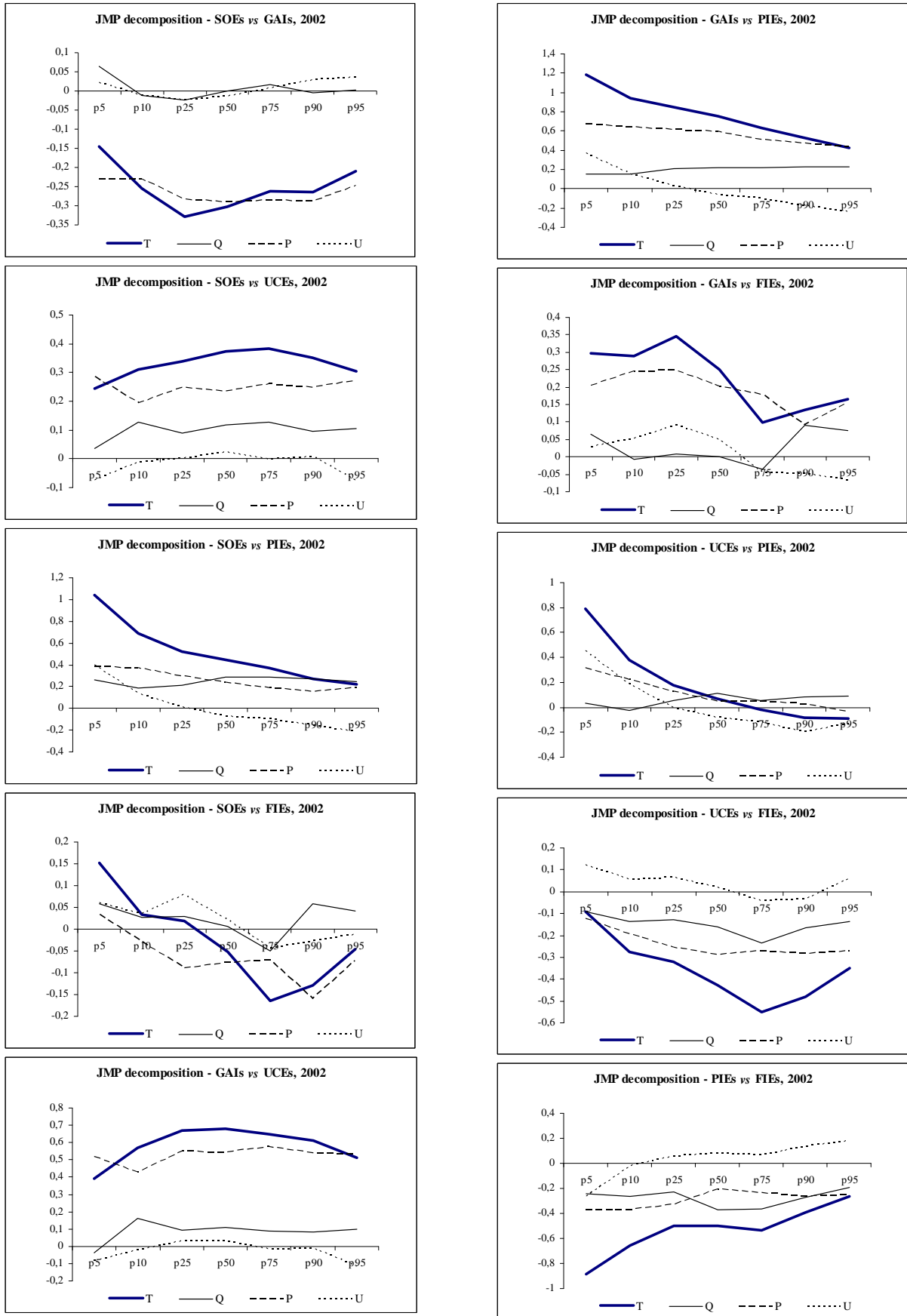
Note: In the national statistics, wages refer to the “total remuneration for labor paid by all organizations directly to all staff and workers of those entities.” The reported classifications by ownership do not distinguish foreign-invested enterprises and private enterprises, which are both included in the category “others.” Average annual wages of staff and workers are deflated by the urban consumer price index (1995=100).

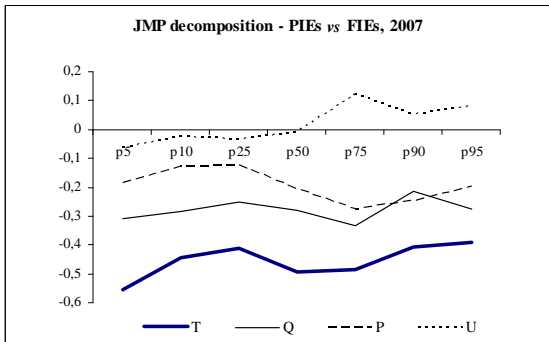
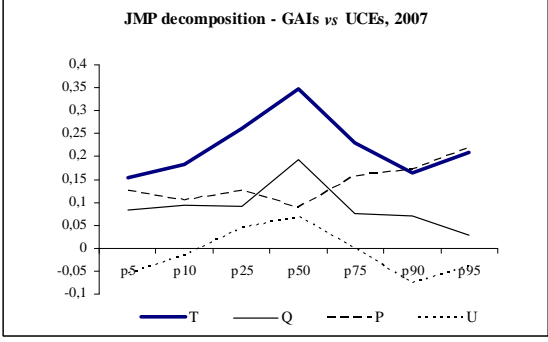
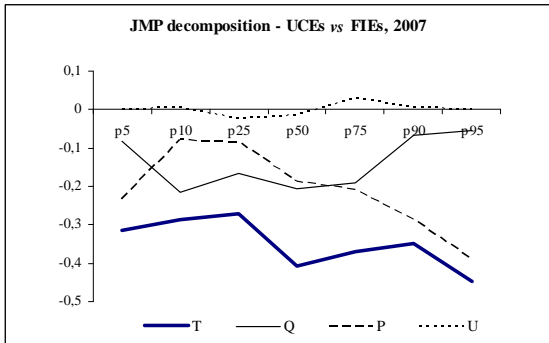
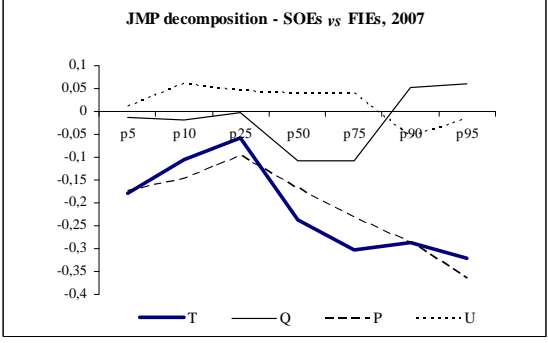
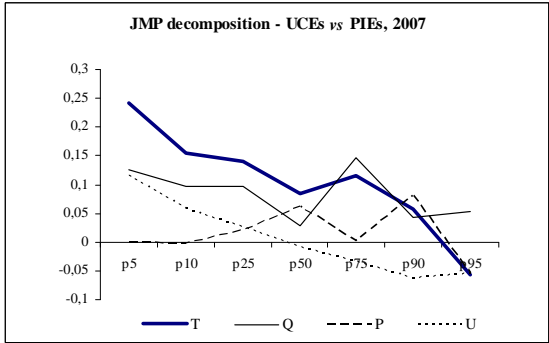
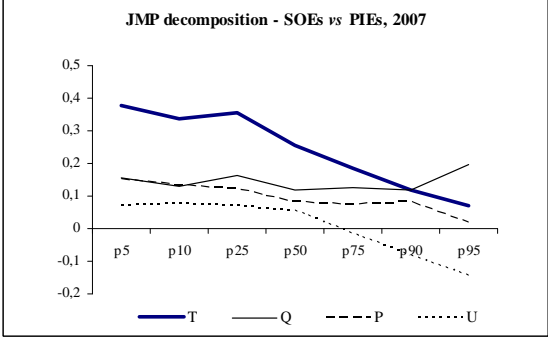
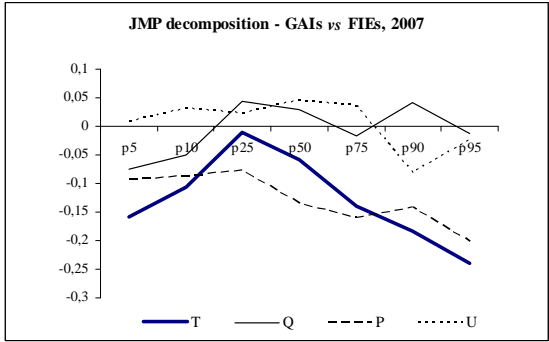
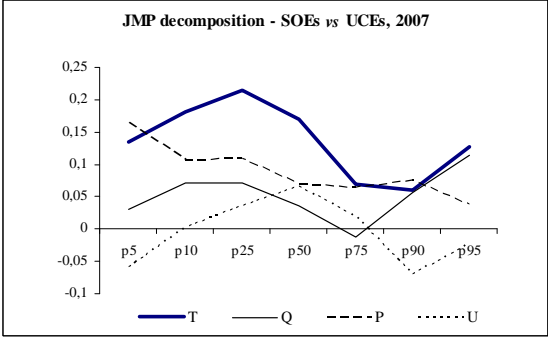
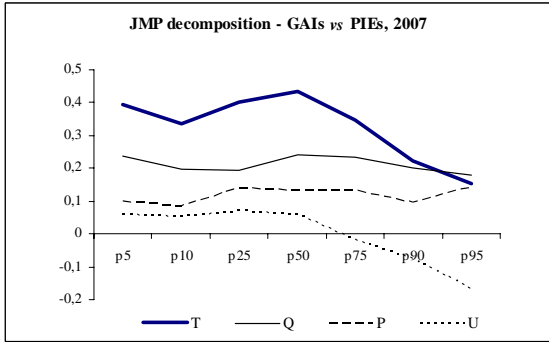
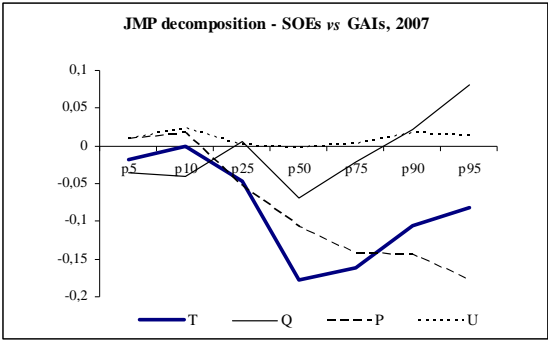
Figure 9.2 Kernel Density Estimations for the Distribution of Income by Ownership Category, 2002 and 2007



*Source:* Authors' calculations using the 2002 and 2007 CHIP survey data.  
*Note:* See Table 9.2. Earnings are deflated using the urban provincial-level spatial price deflators calculated by Brandt and Holz (2006), and updated for 2007. Base: Nationwide prices in 2002.

Figure 9.3 Juhn-Murphy-Pierce Decomposition of Log Hourly Wages by Ownership





---

<sup>1</sup> Although the sampling design for both surveys was based on that of the annual urban household survey conducted by the NBS, there is one discrepancy between the two datasets that should be noted. Indeed, the 2007 CHIP data were collected from a new NBS sample. The sampled households, which joined the survey in 2008, unlike the households in the 2002 survey that had recorded income, reported their income by recalling. According to the NBS, recalled income might be less accurate than recorded income. Unfortunately, it is not possible to provide robustness checks for this, but we believe that given the scope of the identified effects in our analysis, the bias, if any, should not be too strong.

<sup>2</sup> Urban residents are people who live in cities and who hold an urban household registration (*hukou*). Unregistered urban workers such as rural migrants are not included in this dataset.

<sup>3</sup> After restricting the sample to full-time employment, the minimum age of the sample increased to 18. One may argue that with the expansion of higher education, most individuals between the ages of 18 and 22 are still in school, therefore possibly resulting in a bias in the sample selection. However, in the 2007 CHIP the percentage of individuals between the ages of 18 and 22 who were still in school only accounted for 3.6 percent of this age group, and the percentage was even lower in 2002. Hence, such a bias, if any, should not seriously affect our estimation results.

<sup>4</sup> In 2002, the average education level of workers in GAIs was more than twelve years, much higher than that in any other type of enterprise.

<sup>5</sup> Interestingly, this is a complete reversal compared to the 1995-2002 period (see Démurger et al. 2006).

<sup>6</sup> One should note, however, that reported earnings may not fully reflect individuals' actual income in the state sector and may result in an underestimation of earnings. Indeed, the welfare system in the SOEs and GAIs is still much better than that in the FIEs and PIEs, but it is difficult to collect complete information on this, especially with respect to non-pecuniary welfare. Given the comparatively high wages in these two sectors, plus the non-observable income, jobs in SOEs and GAIs can still be as attractive as, or even more attractive than, jobs in FIEs.

<sup>7</sup> This trend confirms the more unequal distribution of hourly wages in the private sector as compared to the public sector that was observed in the 1990s (see Chen, Démurger, and Fournier 2005; Xing 2008).

<sup>8</sup> Non-parametric kernel density estimation is a way to estimate the probability density function of a random variable. In our case, the variable of interest is the logarithm of hourly earnings.

<sup>9</sup> This may reflect our ownership classifications. Indeed, FIEs only include foreign-owned and foreign-controlled enterprises, which are mainly concentrated in the higher-end industries.

<sup>10</sup> Card (1999) provides a brief introduction to all kinds of estimation methods and their respective advantages and disadvantages in terms of returns to education. He suggests that the



---

OLS estimation method is the most robust technique.

<sup>11</sup> The actual work experience is not reported in the 2007 survey. As a consequence, we use the potential work experience, defined as age minus number of years in school minus six.

<sup>12</sup> In the Oaxaca-Blinder decomposition, the reference wage structure is estimated from a pooled model over the entire sample. The reference residual distribution is the average distribution over both samples. The decomposition results presented here are generated using the jmpierce.ado program for Stata.