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**Transitions to Private Employment:
Earnings Determination, Worker Employment Preferences,
and Job Turnover in Urban China**

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Abstract

Despite ongoing restructuring of the Chinese economy, barriers to labor mobility and attendant stratification of China's labor markets remain significant. Those barriers serve to reduce the efficiency of labor market allocations and accordingly inhibit wage equilibration and productivity growth. Constraints on labor mobility further hamper growth in private employment as well as government efforts to rationalize economic activity through the closure of insolvent state-owned enterprises. In this study, we apply unique matched worker-firm data from a recent survey of urban workers to examine existent stratifications of labor markets and transitions to private employment in urban China. In so doing, the analysis assesses wage determination, worker preferences for state versus private employment, and job turnover. As expected, research findings indicate higher returns to schooling in non-state sectors, in cities with more rapid private sector growth, in more profitable enterprises, and for less risk-averse workers. Results further show that preferences for state-sector employment decrease with schooling but increase with worker risk aversion. Workers' job-change prospects decrease with age, risk aversion, and restrictiveness of job preferences. Overall, results point to the importance of labor market transition policies and indicate the sizable efficiency and productivity gains that might arise from enhanced labor mobility.

I. Introduction

In the wake of mounting and sizable losses to unprofitable state owned enterprises (SOEs), there exists a new urgency among Chinese policymakers as regards the restructuring of labor markets and the rationalization of state production.¹ Indeed, the substantial decline in the state share of domestic output over the past decade has yet to result in the large-scale reallocation of labor to the private sector. The transition to private employment has been impeded by a lack of supporting social institutions and by various barriers to labor mobility as are the legacy of central planning.² The attendant stratification of China's labor markets has served to reduce the efficiency of labor allocation and has inhibited wage equilibration and productivity growth. As Lardy [1998] has noted, the failure of the government to close insolvent SOEs and to reallocate surplus state labor has become a critical stumbling block to the long-term success of Chinese economic reform.

In this paper, we focus on the labor market transitions of individual workers in urban China. In so doing, we evaluate the potential welfare gains as well as the perceived costs of movement of labor to the private sector. Specifically, we examine three aspects of individual workers' labor market experiences. First, we revisit the wage structures of urban workers, focusing on differential returns to human capital between the state and the private sectors. Second, we examine the heterogeneity in individual workers' preferences for SOE versus private employment. Third, we analyze individual workers' prospects of switching employers. In so doing, we take advantage of a unique recent survey of urban workers in China's manufacturing enterprises. Our data allow us to relate the heterogeneous labor market experiences of urban workers to their individual

¹ In 1999, newly elected premier Zhu Rongji targeted large scale layoffs of state employees in a wide range of industries (see Lawrence, 1999). A slowdown in economic growth during the year, however, forced the government to scale down the targeted layoff.

² Fan, Lunati, and O'Connor [1998], for example, have suggested the importance of certain institutional developments—notably including the transfer of pension obligations from individual enterprises to the state as well as government-subsidized retraining of redundant SOE workers—in promoting the reallocation of under-employed SOE workers to the private sector. And Rosen [1999], for example, reports that foreign firms in China find it difficult to hire qualified workers due to the legacies of central planning, such as the

characteristics as well as to the attributes of their firms and locations.

Earlier analyses of labor-market transitions in China focus largely on the wage structure.³ Studies of pre-reform periods (through the mid-1980s) suggest very low returns to worker educational investment (see, for example, Byron and Manaloto [1990], Knight and Song [1991], Meng and Kidd [1997], Johnson and Chow [1997], Liu [1998], and Maurer-Fazio [1999]). Using data for the late-1980s, a number of studies found limited evidence of positive returns to educational investment among workers subject to new labor contracts introduced by enterprise reforms (*e.g.* Liu [1998] and Maurer-Fazio [1999]). Indeed, Liu's [1998] analysis of data from the 1988 Chinese Household Income Project remains the most systematic of wage determination studies from that period. Lui's results suggest that returns to schooling among younger workers in Guangdong province--where labor contracting and privatized economic activity were relatively advanced--were twice as high as those for similar workers in other provinces.⁴ While not controlling for variations in human capital or cost-of-living, Sabin [1999] found that average real wages across provinces and ownership forms failed to converge between 1980 and 1992.

Our study extends earlier analyses of labor-market transitions in several important ways. First, we expand the scope of the analysis by examining wage determination, preferences for state versus privatized employment, and potential labor mobility among individual workers in urban China. In so doing, we gain broader insights to the implications of, as well as the obstacles to, labor-market restructuring. Second, in revisiting the wage structure analysis, we use recent data that includes an improved and more complete set of controls for worker and firm characteristics. Further, as is well

residential registration system (*Hu Kou*) and personal documentation system (*Dang An*).

³ There is a considerable volume of studies on labor markets in the transitional economies of Central and Eastern European. Although a number of those studies examine the impact of labor market transition on returns to schooling—and generally find an improvement in the returns in the wake of that transition—most of those studies focus on labor demand and unemployment behavior, given the significance of high unemployment rates in the Central and East European cities. Svejnar [1999] provides a comprehensive survey of this literature.

⁴ However, among senior workers, locational variations in returns to schooling were diminished. Since junior workers were more likely to participate in the “new” labor market, Liu concluded that reforms had raised returns to education.

appreciated, there has been a considerable increase in both the diversification of enterprise ownership structure and in the share of urban employment in the private sector since the pre-1992 time frame of earlier published studies. The recent acceleration in SOE closure, coupled with concomitant layoffs and rural-to-urban labor migration, make transitions to private employment vital to ongoing economic and political stability in China. All of these factors underline the importance of a more up-to-date examination of earnings structure and employment transitions in urban China.

The rich data set enables us to control for such individual and firm characteristics as the workers' attitudes towards risk, job mobility, non-wage compensation, firm size and profitability, and other individual-level worker characteristics that were not available to earlier studies of wage structures. As Ehrenberg and Shwarz [1986] point out, studies seeking to compare wage structures between public and private sectors could suffer from selection and omitted variable bias due to failure to control for heterogeneity in job quality and in workers' risk aversion. Further, as suggested by Gabriel and Rosenthal [1996, 1999], analyses of wage determination that omit location-specific labor market attributes may suffer from omitted variable bias, to the extent that workers' human capital characteristics are correlated with those location-specific attributes. We mitigate these potential biases in our cross-sector comparison of wage structures by including city-specific fixed effects in our earnings regressions. We also interact the workers' schooling with city-specific foreign direct investment levels. We also mitigate potential biases associated with other unobserved worker characteristics by using the two-step correction procedure (as discussed in Lee, 1982) to account for possible endogenous selection of the workers to the different employment sectors in our sample.

Our empirical findings indicate significant heterogeneity in returns to schooling, suggesting substantial misallocation of labor, as well as considerable obstacles to labor mobility. Elevated returns to investment in human capital are evidenced in cities with more rapid private sector growth, among more profitable enterprises, and for less risk-averse workers. Results further show

a positive, albeit moderate, effect of private sector growth on returns to schooling in the state sector; however, more abundant private employment opportunities also serve to widen the gap in returns to schooling between the state and the private sectors.

Analysis of individual workers' employment preferences suggests the importance of non-wage factors to labor market transitions. In particular, low schooling, advanced age, and aversion to unemployment risks discourage workers from seeking private sector employment. Family situation and local mix of state and private employment also influence individuals' preferences for private sector employment. Over time, however, improved educational attainment among Chinese workers—together with the sizable estimated differentials in quality-adjusted compensation between private- and state sectors--should result in growth in worker preferences for private sector employment.

Workers' job-change prospects decrease with age, risk aversion, and the restrictiveness of job preferences. Simulation results further indicate that an increase in worker schooling by 2 years raises the potential worker turnover rate by about 10 percent, whereas an increase in worker age by 10 percent reduces the potential turnover rate by 20 percent. Discontinuation of employer-provided housing or transference of the property rights of such housing from the employer to the employee increases the potential worker turnover rate by 17 percent. Results clearly indicate a higher likelihood of worker job change among more educated and younger workers, for whom the discounted returns on such moves are elevated.

Research findings have important implications for sectoral restructuring and for the privatization of labor markets in China. Stratification of labor markets--as evidenced in substantial estimated quality-adjusted wage differentials among sectors and across cities—inhibits efficient allocation of labor. However, those same quality-adjusted wage differentials do provide a significant economic incentive for worker moves to private sector employment. To facilitate worker moves, more attention must be paid to the development of social infrastructure, including worker retraining programs as well as the economy-wide provision of unemployment and pension

benefits. Further reduction in barriers to labor mobility, including elimination of restrictions on internal migration and development of privatized housing, remains essential to ongoing productivity and economic growth in China.

In the following sections of the paper, we proceed first to a brief review of the enterprise reform process in China, followed by a description of the data and variables used in the study. We then present and interpret empirical analyses of the wage, employer type preference, and job-turnover equations. The final section provides concluding remarks.

II. Enterprise Reforms in China

Reform of state enterprise in China can be divided into three distinct phases. Beginning in 1979-1980, the first phase of reform focused on increasing the operational autonomy of state enterprises by allowing them greater authority over the allocation of profits.⁵ The second phase of reform, initiated in 1985, sought to provide better incentives for management performance in the form of long-term financial contracting between enterprise managers and their bureaucratic superiors. Although enterprises were then allowed to sell their excess output at market prices, price controls remained in place for most of the output of state enterprises. At this stage in the reform process, imposition of bankruptcy proceedings and closure of unprofitable enterprises was practically impossible. The third phase of enterprise reform was initiated in 1993 at the Third Plenum of the 14th Chinese Communist Party Congress. That meeting endorsed the development of diversified forms of enterprise ownership. Large and medium state enterprises were subsequently converted into limited liability shareholding companies, so as to separate government and business functions and to create transferable ownership shares.

During the early 1990s, the state also put into place economic liberalization measures that facilitated the rapid growth of foreign direct investment and private production. In accordance with

⁵ In that context, bonuses quickly became a significant component of the compensation package.

those measures, the state sector share of GDP dwindled to 37 percent in 1998. An additional 33 percent of China's GDP in 1998 derived from the private sector (including foreign joint ventures, domestic private enterprises and proprietorships), with the remainder coming from the agricultural sector and from collective-owned urban, township, and village enterprises.⁶ As a share of total industrial output, for example, production at private enterprises (excluding proprietorships) increased from less than 5 percent in 1990 to nearly 20 percent in 1997.⁷ During that same period, the state share of total industrial output fell from 80 to 25 percent. However, the rapid decline in the state share of domestic output was not accompanied by a proportionate cut back in utilization of labor. In 1998, for example, state enterprises employed in excess of half the urban labor force, compared to less than 20 percent in the private sector, although their output levels were roughly equivalent. Recent studies (*e.g.* Hu and Khan [1997]) suggest that productivity growth in China over the period of reform has derived largely from the expansion of the non-state sector, as productivity in the state sector has remained largely stagnant.

Lardy [1998] argues that the failure to allow for large-scale closure of unprofitable state enterprises poses a serious threat to ongoing efforts to rationalize China's economy. The deferment of fundamental enterprise restructuring, however, derives from the government's objective of maintaining a low level of open unemployment in urban areas—as dictated by political and economic concerns—as well as from the state enterprises' obligation to provide a broad range of social services⁸. Among the consequences of such a policy are on-going and substantial misallocation of human and investment capital. The former arises due to serious impediments to labor mobility. Moreover, the rising state enterprises' indebtedness to state-owned banks has serious adverse consequences as regards the availability of financial capital.

⁶ China Statistical Yearbook 1999.

⁷ Table 1-34 in *Chenjiu Huihuang de Ershi Nian*, State Statistics Bureau, 1998.

⁸ Total welfare expenditure by SOEs in 1996 (including housing) amounted to 34 percent of total wage bill, compared to 26 percent spent by UCEs and 15 percent by other types of enterprises (China Yearbook of Labor Statistics 1997). Wong, Heady and Woo (1995) contain discussions on enterprise-based welfare

Table 1 shows the distribution of urban employment by enterprise type for 1996. In all urban areas, SOEs employed over 56 percent of urban workforce, whereas urban collective enterprises (UCEs), shareholding companies (SHCs), and foreign-joint ventures (FJVs) employed 15, 1.8, and 2.7 percent, respectively. There were, however, considerable variations in the mix of employment across cities. Share of employment in FJVs, for example, was considerably higher in Beijing and in the coastal provinces (Shanghai, Guangdong, and Jiansu). According to our 1997 survey data, SOEs remained a popular employment choice among urban workers. However, their popularity was surpassed by FJVs, which generally offered significantly higher wage rates. In our sample of manufacturing workers in nine provincial capital cities, 29 percent selected SOEs as their preferred type of employer, whereas 18 percent selected SHCs and 37 percent selected FJVs. Despite their importance in the provision of urban employment, only 2 percent of the workers selected UCEs as their most preferred type of employer. UCEs typically are small enterprises controlled by local government bureaus. These entities were established prior to the advent of private enterprise with the objective of absorbing that portion of the urban workforce not employed by the state sector. Relative to SOEs, UCEs generally provide significantly reduced employment benefits and job security.

III. Data and Variables

Our analysis derives from a unique data set that is rich in both individual-level and firm-level variables that allows us to identify the sources of heterogeneity in labor market outcomes in greater detail than what is found in most existing analyses. The data are obtained from a survey of individual workers undertaken by the City University of Hong Kong in 1997.⁹ Survey participants include 3964 employees of manufacturing firms in nine metropolitan areas. The manufacturing sector was selected because it has been the focus of SOE restructuring and has been importantly

system and, in particular, on housing provision.

affected by the ownership diversification since early 1990s. The firms surveyed represent the four primary ownership structures described in the previous section, including state-owned enterprises (SOEs), urban collective enterprises (UCEs), shareholding companies (SHCs), and foreign joint venture firms (FJVs). These sectoral aggregations represent the legacy of the traditional planned economy (the SOEs and UCEs), the privatized large and medium SOEs (the SHCs) and the new private sector (the FJVs).¹⁰ The nine metropolitan areas include provincial capital cities or cities of provincial status at different levels of economic development. Table 2 provides information on the population, per-capita income, and per-capita foreign direct investment in these nine cities. Clearly, both income and foreign direct investment were considerably higher in coastal cities and in Beijing than in those interior provincial capitals. Interviewed workers were divided equally among the 180 surveyed firms, which in turn were divided equally among the nine cities and the four types of ownership. A more detailed description of the sampling procedure and data collection process is provided in Appendix III.

For the purpose of our analysis, we divide the variables into five groups. In the first group are the three dependent variables in our analysis; they are the earnings levels of the individual workers, the preferred employer type indicated by the workers, and the likelihood of job-change foreseen by the workers. Variables in the second group identify the workers' human capital, including schooling, age, gender, and job position. The third group of variables indicates workers' revealed job and risk preferences as well as household characteristics. The fourth group of variables includes employer information, such as financial conditions, number of employees, non-wage benefits, ownership form, and average wage rate. The final group includes the variables indicating the workers' city of residence as well as city economic conditions (as described in Tables 1 and 2). The variables in each group are described in detail below, with a summary of their definition and

⁹ See Fu, Tse and Zhou (2000)

¹⁰ In our sample, state on average controlled 97% of the equity interest in SOEs, 6% in UCEs, 60% in SHCs and 28% in FJVs; urban collective entities controlled 89% of the equity interest in UCEs, 11% in SHCs and

sample statistics provided in Appendix II for easy reference.

Dependent variables

The monthly gross earnings of individual workers, denoted by Y , is reported according to scales ranging from 1 (300 yuan, or about US \$35) to 10 (in excess of 3,000 yuan). Table 3 and Figure 1 indicate the correspondence between this scale and worker income. Table 3 also reports earnings summary statistics by enterprise type and by city. Gross earnings include wages, bonuses, allowances, secondary-job income, and investment income. Overall, the average earnings of the FJV workers was the highest (about 920 yuan per month, see Figure 1), followed by that of the SHC and SOE workers. Average earnings of UCE workers were the lowest of the sectoral classifications at about 740 yuan per month. However, as Table 3 shows, there were also considerable variations in worker earnings across cities. As expected, Table 3 further indicates that the earnings distribution is the most compressed in the SOE sector and the most dispersed in the FJV sector, both in terms of within-city and between-city variation.

A worker's preference for employer types is represented by a binary variable P , which equals 1 when the worker prefers SOE or UCE enterprises to other types of employers. Table 4 shows the distribution of preferred employer types among workers in different enterprise types and of different schooling. The distribution indicates considerable mismatch between workers' current and preferred types of employers. For example, 65 percent of SOE workers would select non-state employer if allowed to choose and 22 percent of the FJV workers indicated a preference for employment in the SOE sector. As is evidenced in Table 4, workers are more likely to prefer their current sector of employment than are workers in other sectors, indicating some self-selection on the allocation of the workers among different types of enterprises. The influence of the self-selection, however, does not appear to be significant. For example, about 34 percent of the SOE workers prefer SOE, compared with 29 percent of the UCE workers, 26 percent of the SHC

7% in FJVs.

workers and 22 percent of the FJV workers who have the same preference. Table 4 further shows that the preference for the traditional sectors (SOE and UCE), or the frequency of P equal to 1, decreases monotonically with schooling, whereas the preference for the privatized and private sectors (SHC and FJV) increases with schooling.

The third dependent variable is the likelihood that individuals will change employers in the near future, represented by an ordered-response variable Q . Q takes integer values ranging from 1 (very unlikely to change employer) to 5 (very likely). Table 5 shows the distribution of the responses. SOE workers appear to have the highest likelihood of a job change (10.4 percent indicated that a job change was likely or very likely). The workers of the newly privatized enterprises (SHCs), on the other hand, appear to have the lowest likelihood of a job change (5.5 percent indicated that a job change was likely or very likely).

Human capital attributes

Worker's schooling, SCH , is measured in years. As shown in Appendix II, SHC workers have the highest average schooling (11.66 years), whereas UCE workers have the lowest (10.96 years). The difference in worker average schooling reflected the elevated status of those former large SOEs relative to that of the UCEs in urban labor markets. Workers tend to be younger in the privatized and private sectors (averaging 37 years of AGE) than in the traditional SOE and UCE sectors (averaging 39 years of AGE). $MALE$ workers are somewhat over-represented in SOEs and under-represented in UCEs. The percentage of workers $MARRIED$ does not appear to vary significantly across the sectors. About 9 percent of the interviewees in our sample are personnel or marketing executives, identified by $MNGR$ equal to 1.

Job and risk preferences, personal and family situations

A number of questions in the survey gauge individual workers' job and risk preferences. The responses to these questions are indicated in 5-level scales, ranging from 1 (very unimportant) to 5 (very important). $LAYOF$ gauges the importance to individual workers of protection from layoff.

Workers with a high *LAYOF* score are those who consider protection from layoff very important for their job selection and are, therefore, highly risk averse. *DISTN* indicates the importance attached to working close to home whereas *PRESR* indicates worker aversion to more stressful job situations. *SECUR* indicates the importance of job security. Workers with high *DISTN*, *PRESR* and *SECUR* scores would then be more constrained in job mobility, owing to highly restrictive preferences. These three variables are averaged to compute a *JOBRST* score, which indicates preference-related restrictions on employment mobility. *HSNG* indicates the importance workers attach to provision of employer provided housing, another measure of non-pecuniary impediments to job mobility. *INCOM* and *PROMT* indicate the importance of salary and promotion opportunities, respectively. These two variables are averaged to compute the *JSHMTV* score, which is taken to reflect a worker's willingness to accept higher levels of risk to obtain elevated income and advancement opportunities. As indicated in the summary data in Appendix II, there do not appear to be obvious differences in these job and risk preference indicators across the four different employment sectors.

Several variables control for changes in workers' financial and family situations. *INCMUP* indicates the change in personal gross monthly income over the past year, ranging from 0 (50 percent reduction) to 9 (100 percent rise). SHC and FJV workers appear to have fared slightly better as regards income improvement, relative to SOE and UCE workers. A worker's family monthly gross income, *FMINCM*, is reported on a scale ranging from 1 (600 yuan or less) to 9 (over 5,000 yuan); again, SHC and FJV workers fared better on this score. A worker's preference for ownership sector may be influenced by the employment status of the worker's spouse; *SPSSOE* equal to 1 indicates that the worker has a spouse working in a SOE or a government office. Workers' job mobility might be constrained in the presence of housing provision by the current employer, indicated by *HSNGST* equal to 1. As expected, the workers in SOEs and SHCs were more likely to live in employer-provided housing than were their counterparts in UCEs and FJVs. Since we do not observe individuals' wage earnings directly but rather their total monthly income,

we include in our earnings analysis dummy variables, *STOCK* and *SAVNGS*, indicating respectively whether the individual owns stock shares and savings deposits; these binary variables control for worker non-wage income.

Firm information

Apart from the ownership type of a worker's employer, identified by *FTSOE*, *FTUCE*, *FTSHC*, and *FTFJV* respectively, for SOE, UC, SHC and FJV enterprises, we also observe the firm's size, measured by the log of the number of employees *FSIZE*; the amount of non-wage employment benefits, measured by the firm's spending on employee benefits as a percentage of total wages *FBNFT*; and the average wage rate in the firm, *FAVWG*, which controls for other firm-specific effects such as job quality and technologies. As the sample statistics in Appendix II show, SHCs are on average largest in size whereas UCEs are the smallest; SOEs and UCEs spend relatively more on employee benefits in terms of percentage of total wages.

The survey also asked the interviewees to assess the financial conditions of their employer, classified on a 5-level scale ranging from 1 (very poor) to 5 (very good). The variable *FFNNC* indicates the current financial status of the employer, whereas *FFNNC1* and *FFNNC5* indicate the expected status one year and five years into the future, respectively.

City-level economic status

In addition to using city-level fixed effects, we also examined how city-specific local economic conditions affected the returns to schooling and the job-market prospects to SOE workers. *CFDIPC* measures city-level variation in per-capita foreign direct investment.

IV. Empirical Specification and Estimation Results

Analysis of earnings structure

In recent years, and in the wake of new availability of matched employer-employee data, the

labor literature has sought to examine the relationship between individual job-market experiences, as in compensation and job turnover, and the heterogeneity of both workers and firms (see Abowd and Kramarz [1999] for a survey of this growing body of literature). This literature focuses on labor markets in developed economies and gives little consideration to within-economy variations in returns to schooling. Given systematic variation in labor-contracting conditions across both enterprise groups and metropolitan areas in China, it is important to allow for heterogeneity in returns to human capital (especially schooling) in our analysis. Following the tradition of labor literature, we specify the conditional expectation of job-market experiences as a linear function of the heterogeneous characteristics of both the workers and the firms. As will be discussed below, it is also important to include metropolitan specific controls in the earnings equation. Thus, our empirical equation for predicting the earnings of individual i in employment sector j and metropolitan area k , Y_{ijk} , has the following structure:

$$Y_{ijk} = H_i \mathbf{a}_{ijk}^Y + A_i \mathbf{b}^Y + F_i \mathbf{I}_j^Y + \mathbf{g}_{jk}^Y + \mathbf{e}_i^Y. \quad (1)$$

In equation (1), H_i is a set of human capital variables, such as schooling, gender and age; the returns to human capital, \mathbf{a}_{ijk}^Y , are allowed to vary according to the individual attributes (*e.g.* risk attitudes), the employer attributes (*e.g.* ownership form and profitability) and the metropolitan area conditions (*e.g.* local foreign direct investment conditions). The differential returns to human capital across sectors reflect labor mobility costs and heterogeneity in labor-contracting conditions. A_i is a set of individual characteristics, such as job preferences and the ownership of stocks and savings deposits, whose effects on individual earnings, \mathbf{b}^Y , are not expected to vary across sectors. F_i is a set of attributes specific to the worker's employer, such as number of employees, employer-provided benefits, and the firm's financial conditions; the compensating variations in nominal earnings, \mathbf{I}_j^Y , may depend on the ownership type of the firm. \mathbf{g}_{jk}^Y are a set of ownership-specific metropolitan-level fixed effects, which control for systematic locational variation in the cost of

living and labor market conditions. Finally, e_i^y is individual-specific earnings prediction error.

In labor markets with low costs of mobility, one would expect little variation across firms in returns to schooling, although wage compensation could vary between firms to offset differences in job security and non-wage benefits. Differential returns to schooling derive from costly job switching and from labor-contracting conditions that vary across firms. The labor-contracting conditions may reflect not only the firm's ownership form but also by the firm's financial conditions. In addition, differential returns to schooling may depend also on individual risk preferences, which in turn affect worker job search and job selection. Other worker-specific and firm-specific variables enter the earnings equation to control for differential human capital, job opportunities, ownership of financial assets, and for wage-compensating variation with respect to job quality and non-wage labor compensation.

In markets with mobile households, geographic differences in nominal earnings across similarly endowed workers should be offset by compensating variations in locational attributes and in the cost-of-living. Analyses of wage determination that omit locational amenities and cost-of-living differentials will suffer from omitted variable bias, to the extent that observable worker characteristics influence both the worker's skill level and the worker's residential location (Gabriel and Rosenthal [1999]). In recent work, Gabriel and Rosenthal showed that inclusion of metropolitan-area fixed effects in wage regressions yields consistent estimates of returns to human capital. As is well appreciated, however, the assumption of fully mobile workers and a long-run open-city equilibrium framework is not fully applicable to wage determination in China's transitional economy. Furthermore, nominal differences in quality-adjusted wages may persist across cities in China due to variations in local labor market conditions in the presence of barriers to labor mobility as well as because of centrally planned differentials in locational wages in the SOE sector. Also, human capital may be distributed unevenly across metropolitan areas owing to a combination of both individual selection and planning effects. Accordingly, in our earnings

analysis, we utilize locational fixed effects to proxy a combination of both equilibrium and disequilibrium influences.

Controlling for location-specific effects appears to be especially important to the objective of assessing differential returns to human capital across labor-market segments. In that regard, the absence of locational effects may bias estimates of returns to schooling in opposite directions for state and non-state sectors. As shown in Table 1, private job growth has been especially robust in major coastal cities and in Beijing. As a result, the likelihood that more educated workers would be employed in the private sector rather than the state sector would be higher in coastal cities than in interior cities. Indeed, Table 6 shows that average years of schooling for the SHC and FJV workers in our sample is higher in high-income coastal cities than in the lower-income interior cities; however, the opposite appears to be the case for SOE and UCE workers. Consequently, returns to schooling could be overestimated for private sector workers in the absence of locational controls, since more educated private-sector workers earn more in part because they are more likely to reside in those higher-income cities. In contrast, the earnings of more educated public-sector workers are depressed in part because they are less likely to reside in coastal cities.

Given low mobility costs and the inclusion of controls for locational variation in cost of living and amenities, one would expect little variation in returns to schooling across cities. However, considerable barriers to inter-city labor mobility remain in China, especially for educated workers (see Rosen [1999]). Thus, returns to schooling could vary across cities in our sample owing to variation in geographic demand for skilled workers in the presence of mobility constraints.

Lastly, we consider the possibility that the workers' affiliation with their current type of employer is endogenous to their characteristics.¹¹ To the extent that some unobserved worker characteristics affect both the workers' earnings and their selection of (or being selected to) the employer type, the errors in predicting the workers' employer type would be correlated with the

¹¹ Bender (1998) reviews the effects of sample selection on empirical findings of government-private sector

earnings prediction errors \mathbf{e}_i^Y . As such, a joint estimation of both the employer-type selection equation and the earning equation, taking into account the possible correlation in their residual errors, could improve the estimation efficiency by further mitigating the potential omitted-variable bias. We address this concern using the generalized two-stage correction procedure of Lee (1982). In the first stage, we estimate a multinomial logit model of individual workers' selection of their ownership sector and compute the inverse Mills ratio (MR_{ij}) for individual workers (i) according to their employer-type affiliation (j); the multinomial logit estimates and the computation of the MR_{ij} are reported in Appendix I. In the second stage, we include the MR_{ij} in the wage equation to correct for potential omitted variable bias, so that equation (1) becomes:

$$E(Y_{ijk}|I_i = j) = H_i \mathbf{a}_{ijk}^Y + A_i \mathbf{b}^Y + F_i \mathbf{l}_j^Y + \mathbf{g}_{jk}^Y + \mathbf{s}_j \mathbf{r}_j MR_{ij} \quad (2)$$

where $I_i = j$ indicates the i -th worker's affiliation with sector j and \mathbf{r}_j is the correlation between the wage prediction error \mathbf{e}_{ij} and the error in the selection model (see Appendix I for details).

The estimates of the earnings models are reported in Table 7. The 2nd and 3rd columns report estimation findings without correction for potential selection bias. The coefficient for *SCH* indicates returns to schooling among SOE workers; as shown, the estimated coefficient is statistically significant but not economically significant. The estimated return to schooling in the SOE sector is about 1.2% of the sample mean earnings.¹² This estimate applies to individuals with high risk aversion ($LAYOFF \geq 4$) and in financially distressed enterprises ($FFNNC \leq 3$). We find that the return to schooling is about 0.5 percentage point higher for less risk-averse individuals ($LAYOF < 4$) and for individuals employed in well-performing firms ($FFNNC > 3$); these differentials are not statistically different across the ownership sectors. Thus, even for more risk tolerant individuals in financially solvent enterprises, the return to schooling in the SOE sector is

wage differentials.

¹² The 1.2% return to schooling in the SOE sector is computed as the coefficient 0.0508 multiplied by the income scale increment of 200 yuan and divided by the mean income level of 834 yuan.

only about 2.2%, still considerably below the overall return to schooling of 3.6% reported by Liu [1988] using earlier data from the 1988 Chinese Household Income Project.¹³ This result suggests only limited improvement in labor productivity in the SOE sector during the 1990s.

Estimated returns to schooling are higher among other employment sectors; furthermore, the differentials are statistically significant. The estimated returns to schooling in the UCE, SHC and FJV sectors are 2.8%, 3.3%, and 6.3% respectively (for individuals with high levels of risk aversion and in financially distressed enterprises). Note as well that in our sample, the estimated returns to schooling in the private sector are considerably higher than those reported by Liu [1998]. Further, as expected, our estimates indicate that the scale of metropolitan private employment serves to elevate returns to schooling, and that effect is even greater for FJV workers.

As shown in the 4th and 5th column of Table 7, the correction for potential selection bias slightly increases the estimate of returns to schooling for the SOE sector, which becomes 1.3% of sample mean Y , and reduces the differential returns to schooling for the other sectors. The returns to schooling are about twice as large in the UCE and SHC sectors as in the SOE sector, but the differentials are no longer statistically significant. The returns to schooling for the FJV sector are 4.3 percentage points higher than that in the SOE sector and the difference remains statistically significant. The earnings differentials at different levels of schooling between the UCE, the SHC and the FJV workers, on the one hand, and their counterpart in the SOE sector, on the other hand, are depicted in Figure 2. UCE workers earn less than SOE workers do at all levels of schooling, except for those with a college education or above, who earn slightly more than their counterparts in the SOE sector. The pattern reverses when SHC workers are compared with their counterparts in the SOE sector; the former earn more at all levels of education except for those at the lowest level. In contrast, the private sector earnings vary considerably with worker education level; in that regard, the private sector provides considerably more wage reward compared with the SOE sector

¹³ See Kosters [1990], O'Neill [1990], and Murphy and Welch [1992] for evidence on returns to schooling in

for workers with a high school education or above, but considerably less compensation to those with a primary education or below.

The coefficient for the selection variable *MR* is negative for SOE and UCE workers but positive for SHC and FJV workers, suggesting that those who are affiliated with SOE and UCE enterprises for unobserved reasons tend to earn less (large errors in the selection model), whereas those who work in privatized and private enterprises tend to earn more. These corrections appear consistent with one's expectation that individuals who choose to remain in traditional state employment tend to be more risk averse whereas those who choose to work in the private sector tend to be more aggressive and less risk averse. The selection correction, however, is statistically significant only for FJV workers. Here our results indicate that correction for selection bias is important for estimating differential returns to schooling between the traditional and private sectors in transition economies.

The correction for selection bias has little effect on the remaining estimates of the earnings equation. We find that earnings increase with worker seniority, as proxied by the *AGE* variable. A 10% increase in age serves to raise earnings by about 2.5%. Unlike earlier studies of wage determination in Chinese labor markets, we do not find evidence of differential returns to schooling between male and female workers in our sample (the interaction between SHC and gender has a statistically insignificant effect and thus is not included in the final estimation). We do find a considerable earnings premium for male workers, who on average earn about 8.5% more than their female counterparts, and the gender gap is even higher in the private sector, where male workers on average earn about 17% more.¹⁴ Given our gross earnings measure, it is plausible that the results in part reflect the additional time spent pursuing over-time or secondary employment by males, whereas women likely spend more after-work time in family-related and household tasks. Further,

U.S. labor markets.

¹⁴ See Montgomery and Wascher [1987] and Blau and Beller [1992] for evidence on gener-related earnings differentials in U.S. labor markets.

the individuals who have more restrictive job preferences (an increase in *JOBST* by 1) earn about 2.8% less. Managers, those with stock investment, and those with higher savings balances earn 13.3%, 4.4% and 8.9% more, respectively.

Findings further indicated that in the FJV sector, wage rates vary inversely with firm size. In that sector, a 10% increase in the firm's number of employees is associated with a 0.45% decrease in wage rates. No statistically significant compensating variation with respect to firm size is found in other ownership sectors. As expected, we find a compensating variation in wage rates with respect to employer-provided benefits in all sectors. On average, a 10% increase in employee benefits as a fraction of wages is associated with a 0.19% decrease in wage rates.¹⁵ Individual earnings also vary in tandem with firm-specific wage levels; a 10% upward movement in firm average wages above the sample mean level translates into a 0.54% increase in individual earnings.

We also find evidence of profit-sharing between workers and firms in the SOE, UCE and SHC sectors. Workers employed in more profitable enterprises (an increase in *FFNNC* by 1) in those sectors earn about 7% more; in contrast, workers in more profitable FJVs earn only about 2.4% more.

Finally, we find significant variations both in adjusted average earnings across locations (the city-level fixed effects) and in adjusted sector-specific earnings across locations (the ownership-specific city-level fixed effects). The *F* test rejects the restriction at less than 1% significance level that all city-level (9×4-4) fixed effects are jointly zero. In particular, the 8 city-level fixed effects explain more than 4% of the variance in worker earnings and the 8×3 sectoral variations in the city-level fixed effects explain additional 6% of the earnings variance. All together, almost 60% of the variance of earnings is explained by the model.

Analysis of employer-type preferences

The estimated earnings differentials reported in the previous subsection indicate considerable

misallocation of educated workers in the SOE sector as well as potentially substantial welfare gains to educated workers who move to the private sector. However, it is not clear whether workers perceive of such potential gains. Moreover, the analysis of earnings structure does not speak to the presence of non-pecuniary costs associated with labor market restructuring. In order to gain further insight as regards labor market conditions in Chinese cities as well as the potential welfare impact of labor market restructuring on the urban workforce, we examine worker preferences in the selection of employer types. Workers in our sample were asked to indicate what their choice of employer type (including SOE, UCE, SHC, FJV, domestic private enterprise, proprietorship, and others) if they were given the chance to choose. Using this information (see the summary statistics in Table 4), we construct a binary variable P_i , which equals one when worker i selects SOE or UCE enterprises and equals zero when a worker selects other types of employer. Given that very few workers select UCEs, P largely indicates a preference for the longstanding SOE state sector employers relative to the newly emerging employers in the non-state sectors.

We postulate that a worker's employer-type preference depends on the worker's human capital (education, age, and gender), job and risk preferences, family background (which influences the worker's job preferences and risk tolerance), experience with the current employer, and metropolitan-area conditions. In particular, we let the underlying but unobserved preference of worker i for state sector, p_i^* , be a linear function:

$$p_i^* = H_i \mathbf{a}^P + A_i \mathbf{b}^P + F_i \mathbf{l}_j^P + \mathbf{g}_{jk}^P + \mathbf{h}_i \quad (3)$$

where H_i is the set of human capital characteristics that affect the employment preferences of worker i ; A_i includes the worker's indicated job and risk preferences and family background; F_i indicates the worker's current employment experience, whose effect \mathbf{l}_j^P depends on the sector j in which the worker is employed; \mathbf{g}_{jk}^P represents firm-type and metropolitan area controls; and \mathbf{h}_i is a

¹⁵ Computed as $0.4 \times 10\% \times 4.8\%$.

residual error assumed to have a normal distribution. Since p_i^* is not but the selection of the preferred employer type when P_i is observed, we estimate the linear equation (3) using a binary dependent variable model:

$$\Pr(P_i = 1) = \Pr(p_i^* > \mathbf{d}) = \Pr(\mathbf{h}_i > \mathbf{d} - H_i \mathbf{a}^P - A_i \mathbf{b}^P - F_i \mathbf{I}_j^P - \mathbf{g}_{jk}^P) \quad (4)$$

where δ is a preference threshold parameter to be estimated jointly with the other parameters of the linear model.

The results of the binary probit estimation are reported in Table 8. Estimation findings indicate that worker preference for SOE employment varies inversely with educational attainment (*SCH*), which is consistent with the substantially high returns to schooling in the private sector reported in the previous subsection. Worker preference for SOEs increases also with *AGE*, perhaps due to positive co-variance of risk aversion with age. We further find that employment risk aversion (*LAYOF*) and restrictive job preferences (*JOBRST*) serve to discourage workers from going to the privatized or private sectors; in contrast, preferences for higher pay and improved advancement opportunities (*JSHMTV*) encourage workers to go to the privatized or private sectors. These estimates echo the estimation results of the selection model reported in Appendix I but with somewhat greater statistical significance; the difference in the statistical significance is perhaps due to the fact that the workers' affiliation with their current type of employer does not fully reflect their preferences. Further analysis shows no gender differences in employer-type preferences and no differences in the age effects across the ownership sectors.

In analyzing how the workers would select employer types, we further control for the workers' family and firm situations. We find that workers with a spouse employed by a SOE or a government office (*SPSSOE* =1) were more likely to favor SOE employment, whereas workers with relatively high family incomes (*FMINCM*) were more likely to favor non-state sectors. Spousal employment in the state sector may reduce worker exposure to the private sector, whereas having a higher family income may encourage workers to be more accepting of job market risks.

We also find that, other things being equal, SOE workers are more likely to choose the SOE sector than their counterparts in other sectors, and workers in relatively more profitable SOEs (a higher *FFNNCI*) are even more likely to do so. These results suggest that workers' choice of employer types are motivated not only by the differential job market opportunities, as reflected by the workers' education level and job preferences, but also by other factors such as their knowledge of the private job markets or their perceived risks of non-state employment.

There are considerable variations in preferences for the SOE sector across the cities. Our analysis shows that SOE popularity is positively correlated with the share of employment in FJVs in a city (*CFJVS*). One possible explanation is that the SOEs in cities with a larger FJV sector tend to be better run, as indicated by the improved returns to schooling in the SOE sector in cities receiving more foreign direct investment per capita.

Analysis of potential worker turnover rates

As evidenced above, the inclination of some workers to choose SOE employment, even when faced with more remunerative private-sector job prospects, suggests the presence of non-pecuniary opportunity costs associated with private-sector employment. In that regard, additional insights to the obstacles to reallocating SOE employees to non-state sectors can be gained by examining how the earnings differentials and the mismatch between workers' preferred and current employer types, as reported in the foregoing analyses, would motivate worker turnover. The below analysis investigates potential worker job turnover using sample information on worker likelihood of switching employers in the foreseeable future. That likelihood for worker *i*, denoted by Q_i , was reported at 5 levels, from 1 (very unlikely) to 5 (very likely).

A number of proxies for economic return on job switching are considered in the analysis. Specifically, it is anticipated that workers employed in enterprises suffering from poor financial conditions, more educated workers in SOE or UCE sectors, and workers in cities with a more highly developed private labor market would have greater incentive and opportunity to switch

employment. At the same time, the prospects of switching to a new employer would be hindered by the costs and risks associated with a job change. Workers with more restrictive job preferences or higher employment search costs would be less likely to consider a job change. In that regard, more risk-averse workers would be less likely to consider a job change, as future uncertain economic returns on job switching would be less valuable to them; and so would married female workers, as they are more likely constrained by family responsibilities. Similarly, older workers would be less likely to consider a job change, as the expected risk-adjusted cumulative economic return on such a move would be constrained by fewer remaining years of labor force participation.

In the empirical analysis, we represent a worker's assessment of the likelihood of a job change as a linear function of the risk-adjusted net economic returns of such a change. Thus, letting q_i^* be the i -th worker's motivation to seek employment adjustment, we have

$$q_i^* = H_i \mathbf{a}_j^Q + A_i \mathbf{b}^Q + F_i \mathbf{I}_j^Q + \mathbf{g}_{jk}^Q + \mathbf{m}_i \quad (5)$$

where H_i , A_i and F_i are the i -th worker's human capital, personal and firm characteristics that may affect the risks and the expected returns of a job change, \mathbf{g}_{jk}^Q 's are city-level effects, whose impact on job-change motivation may depend on the employment sector the worker is in, and \mathbf{m} is the residual error assumed to have a normal distribution. Since we do not directly observe q_i^* but observe the workers' indicated job-change likelihood Q_i , we estimate the linear equation (5) using an ordered dependent variable model:

$$\begin{aligned} \Pr(Q_i = n) &= \Pr(\mathbf{d}_n > q_i^* \geq \mathbf{d}_{n-1}) \\ &= \Pr(\mathbf{d}_n - H_i \mathbf{a}_j^Q - A_i \mathbf{b}^Q - F_i \mathbf{I}_j^Q - \mathbf{g}_{jk}^Q > \mathbf{m}_i \geq \mathbf{d}_{n-1} - H_i \mathbf{a}_j^Q - A_i \mathbf{b}^Q - F_i \mathbf{I}_j^Q - \mathbf{g}_{jk}^Q) \end{aligned} \quad (6)$$

where \mathbf{d}_n 's are incentive threshold parameters to be estimated jointly with the other parameters of the linear function ($\mathbf{d}_0 = -\infty$ and $\mathbf{d}_5 = +\infty$).

We report our ordered probit estimates for equation (6) in Table 9. As expected, the job-change prospects are elevated for more educated workers, as indicated by a positive and statistically significant coefficient for *SCH*. According to the simulation results reported in the last column of

Table 9, where the potential worker turnover rate is defined as the probability that $Q_i = 4$ or $Q_i = 5$, an increase in schooling by 2 years from the base value would raise the worker turnover rate by 10%. Further analysis, however, does not support the hypothesis that schooling has differential effects on the job-change prospect of the workers in different sectors, as one would expect given the substantially lower returns to schooling in SOE and UCE sectors. The results thus suggest considerable barriers to employment adjustment by under-employed educated workers in the traditional planned sectors.

As anticipated, the likelihood of job change declines with worker *AGE*, as do the discounted returns on the job change over the remaining years in the labor force. A 10% increase in age from 37 would reduce the potential turnover rate by 20%. Similarly, married female workers on average are 23% less likely to seek employment adjustment, as they are more likely constrained by their household responsibilities. Worker risk and employment preferences have important effects on a worker's motivation to seek employment adjustment. Higher risk aversion (*LAYOF*), more restrictive job preferences (*JOBRST*) and greater reliance on employer provided housing (*HSNG*) discourage worker turnover; a decrease by 1 in the score of these variables would raise the potential job turnover rate by 25%, 14% and 16% respectively. Receipt of in-kind benefits from employers discourages job adjustment; for example, workers who lived in employer-provided housing (*HSNGST* =1) are 17% less likelihood to seek employment change than those who did not. As would be expected, findings further indicate that workers who favored private sector employment are 33% more likely to actively seek employment adjustment, perhaps because of their lower levels of risk aversion or relatively greater job opportunities in non-state sectors. However, the hypothesis that mismatched SOE and UCE workers would be more actively seeking employment adjustment is not supported by the estimates, as the coefficient for the interaction of a preference for non-state employment and an affiliation with SOE or UCE is not statistically different from zero. The results again suggest substantial barriers to employment adjustment by SOE and UCE workers who indicate a preference for a different employer type.

In our analysis of the potential worker turnover rates, we control for several individual- and firm-specific factors that may affect workers' preferences for job-adjustment. For instance, individuals who experienced improvements in their income during the prior year (*INCMUP*) are hypothesized to be less motivated to change their job; we find that an increase in the *INCMUP* score by 1 reduces the potential turnover rate by 6%. Worker inclination to change employer may be damped in the case of large employers (*Fsize*), who might offer more diverse job opportunities within the firm; indeed, we find that the likelihood to seek a new employer is 1% lower among workers employed in enterprises that are 10% larger than the base case. In addition, we hypothesize that firms with a strong present or expected future financial condition (a high score for *FFNNC* or *FFNNC5*) might provide more rewarding employment opportunities and thus might experience lower employee turnover rates. Our results show that the likelihood of employee turnover would be 16% and 11% lower respectively in the case of a unit increase in these financial condition scores.

Finally, we examined the effects of local economic conditions on potential worker turnover rates. As would be expected, results indicate that local foreign direct investment (*CFDIPC*) raises the potential turnover rates of the SOE and UCE workers, although it has little effect on the overall worker turnover rate in the city. A doubling in the foreign direct investment per capita increases the potential SOE and UCE worker turnover rates by 12%. We further examine the effects of the sectoral wage gap on potential worker turnover rates. To do so, we construct a new variable, *CGAP*, equal to the city-level fixed effects specific to the FJV sector minus that of the SOE sector as estimated by the earnings regression reported in Table 7. *CGAP* represents the city-specific earnings differential between the FJV and the SOE sectors. Since the city-level fixed effects specific to the SOE, UCE and SHC sectors are highly positively correlated across the sectors (with an average correlation coefficient of about 0.7), a greater *CGAP* indicates a larger earnings differential between the FJV sector and the other sectors in the city for a typical worker. A larger earnings gap thus would encourage worker turnover, especially in the SOE sector, in the city. We

find that in cities where *CGAP* is about one standard deviation above the sample mean, the potential overall worker turnover rate in non-SOE sectors would be 12% higher than in an average city, whereas the potential SOE worker turnover rate would be about 32% higher. The results thus suggest the potential of more rapid labor market restructuring in cities where private sector growth is strong and private-sector demand for labor is high.

V. Conclusion

This study assesses transitions to private employment in urban China. In so doing, the study applies unique matched worker-firm data from a recent survey of urban workers to analyze the earnings structure of workers in different ownership sectors, their selection of preferred employer types, and their potential job turnover. In particular, the research evaluates the extent of labor market stratification following the introduction of diversified enterprise ownership, attendant differential returns to human capital, and ongoing barriers to labor reallocation. Overall, results indicate that barriers to labor market adjustment and stratification of China's labor markets remain significant. For instance, research findings indicate substantially higher returns to schooling in the private FJV sector relative to the SOE sector, where little positive wage effect of schooling is evidenced. Elevated returns to investment in human capital are evidenced in cities with more rapid private sector growth, among more profitable enterprises, and for less risk-averse workers. Results further indicate a positive, albeit modest, effect of growth in private employment on returns to schooling in the state sector. However, more abundant private employment opportunity also serves to widen the gap in returns to schooling between the state and the private sectors and encourages job turnover in the SOE sector.

Analysis of worker preferences among employer-types suggests that the preference for state-sector employment declines with schooling and with the improved pay and advancement opportunities available in the private sector. On the other hand, worker preferences for SOE employment increase with worker age, risk aversion, and restrictiveness of job preferences.

Ongoing gains in population educational attainment, coupled with the above estimated differentials in quality-adjusted compensation between state and private sectors, should result in continued growth in worker preference for private sector employment.

Finally, potential worker turnover decreases with age, risk aversion, in-kind employer-provided benefits, and restrictiveness of job preferences. Married female workers also appear to face greater obstacles to job turnover. Simulation results further indicate that an increase in worker schooling by 2 years raises the potential worker turnover rate by about 10 percent, whereas an increase in worker age by 10 percent reduces the potential turnover rate by 20 percent. Discontinuation of employer-provided housing or transference of the property rights of such housing from the employer to the employee increases the potential worker turnover rate by 17 percent. Results clearly indicate the higher likelihood of job moves among younger and more educated workers, for whom the private sector provides more rewarding risk-adjusted job opportunities.

Research findings have important implications for SOE restructuring and for the development of private labor markets in China. Sectoral and geographic barriers to labor mobility inhibit efficient re-allocation of labor, resulting in the substantial estimated quality-adjusted wage differentials between private and state sectors and across cities. The estimated sectoral differences in returns to schooling do, however, provide economic incentive for workers to select privatized and private-sector employers, though their search for more productive private employment is discouraged by the relatively high transactions costs associated with job adjustment. Worker turnover can be facilitated in part by such policy initiatives as enhanced portability and coverage of a national pension system, privatized housing development, elimination of restrictions on internal migration, and development of labor market intermediaries as well as government-supported retraining of older workers. While costly as regards labor displacement and possible political unrest, job moves would be importantly facilitated by fundamental restructuring of the SOE sector. That restructuring remains essential to ongoing productivity and economic growth in China.

References

- Abowd, John M. and Francis Kramarz, "The Analysis of Labor Markets Using Matched Employer-Employee Data," Handbook of Labor Economics vol 3b: 2630-2710. Orley Ashenfelter and David Card (eds.), Elsevier: Amsterdam (1999)
- Beeson, Patricia and Randall Eberts, "Identifying Productivity and Amenity Effects in Interurban Wage Differentials", *The Review of Economics and Statistics*, 443-461 (1989).
- Blau, Francine and Andrea Beller, "Black-White Earnings over the 1970s and 1980s: Gender Differences in Trends", *Review of Economics and Statistics*, LXXIV, 276-286, (1992).
- Bender, Keith, "The Central Government-Private Sector Wage Differential." *Journal of Economic Surveys*, 12:2, 177-220 (1998).
- Blomquist, Glenn, Mark Berger, and John Hoehn, "New Estimates of the Quality of Life in Urban Areas", *American Economic Review*, March, 78, 89-107 (1988).
- Byron, Raymond and Evelyn Manaloto. Returns to Education in China. *Economic Development and Cultural Change* 38, 783-96 (1990).
- "China Statistics Yearbook", State Statistical Bureau, Chinese Statistics Publishing House, Beijing (1997)
- Ehrenberg, Ronald G. and Joshua L. Shwarz, "Public-Sector Labor Markets", Handbook of Labor Economics vol 2: 1219-1260. Orley Ashenfelter and Richard Layard (eds.), Elsevier Science Publishers B.V., Amsterdam (1986)
- Fan, Gang, Maria-Rosa Lunati, and David O'Connor. Labour Market Aspects of State Enterprise Reform in China. OECD Development Centre Technical Papers, No.141 (1998).
- Fu, Yuming, David Tse, and Nan Zhou, "Housing Choice Behavior of Urban Workers in China's Transitional Housing Market", *Journal of Urban Economics*, 47, 67-81 (2000).
- Gabriel, Stuart, Matthey, Joe, and William Wascher, "Compensating Differentials and Evolution in the Quality-of-Life Among U.S. States". Forthcoming, *Regional Science and Urban Economics*, 2001.
- Gabriel, Stuart and Stuart Rosenthal, "Commute Times, Neighborhood Effects, and Earnings: An Analysis of Compensating Differentials and Racial Discrimination." *Journal of Urban Economics*, 40, 61-83 (1996).
- Gabriel, Stuart and Stuart Rosenthal, "Location and the Effect of Demographic Traits on Earnings", *Regional Science and Urban Economics*, 29, 445-461 (1999).
- Gyourko, Joseph and Joseph Tracy. "An Analysis of Public- and Private- Sector Wages Allowing for Endogenous Choices of Both Government and Union Status." *Journal of Labor Economics*, 1988, Vol. 6, No. 2: 229-253.

- Hu, Zuli F. and Mohsin Khan, "Why is China growing so fast?" International Monetary Fund. Staff Papers, International Monetary Fund, Washington, 44:1, 103-132, (March 1997)
- Johnson, Emily-N. and Gregory C. Chow. Rates of Return to Schooling in China. *Pacific-Economic-Review* 2(2), 101-13 (1997).
- Kosters, Marvin, "Schooling, Work Experience, and Wage Trends", *American Economics Association Papers and Proceedings*, 80, 308-312 (1990).
- Knight, John and Lina Song. "The Determinants of Urban Income Inequality in China." *Oxford Bulletin of Economics and Statistics* 53, 123-54 (1991).
- Lardy, Nicholas R., China's Unfinished Economic Revolution, Brookings Institution Press, Washington, D.C. (1998).
- Lawrence, S., "True Colours", *Far Eastern Economic Review*, March 26, Vol. 162, No. 12 (1999).
- Lee, Lung-Fei. "Some Approaches to the Correction of Selectivity Bias." *Review of Economic Studies* 49 (July 1982): 355-72.
- Lee, Lung-Fei. "Generalized Econometric Models with Selectivity." *Econometrica* 51, No. 2 (March 1983): 507-12.
- Li, Wei, "The Impact of Economic Reform on the Performance of Chinese State Enterprises, 1980-1989," *The Journal of Political Economy*, 105:5, 1080-1106, (October 1997)
- Liu, Zhiqiang. Earnings, Education, and Economic Reforms in Urban China. *Economic Development and Cultural Change* 46:4, 697-725 (1998).
- Maurer-Fazio, Margaret, "Earnings and Education in China's Transition to a Market Economy: Survey Evidence from 1989 and 1992," *China Economic Review*, 10:1, 17-40, (Spring 1999)
- Meng, Xin and Michael P. Kidd. Labor Market Reform and the Changing Structure of Wage Determination in China's State Sector during the 1980s. *Journal of Comparative Economics* 25:3, 403-421 (1997)
- Montgomery, Edward and William Wascher, "Race and Gender Wage Inequality in Services and Manufacturing", *Industrial Relations*, 26, 284-290 (1987).
- Murphy, Kevin and Finis Welch, "The Structure of Wages", *Quarterly Journal of Economics*, 285-326 (1992).
- Parker, Elliott, "Are wage increases in Chinese state industry efficient? Productivity in Nanjing's machine-building industry," *Contemporary Economic Policy*, 17:1, 54-67 (January 1999)
- O'Neill, June, "The Role of Human Capital in Earnings Differences Between Black and White Men", *Journal of Economic Perspectives*, 4, 25-45 (1990).
- Roback, Jennifer, "Wages, Rents, and Amenities: Differences Among Workers and Regions", *Economic Inquiry*, 26 (1988).

Rosen, Daniel H., *Behind the Open Door: Foreign Enterprises in the Chinese Marketplaces*, Institute for International Economics, Washington DC, January 1999.

Rosen, Sherwin, "The Theory of Equalizing Differences", *Handbook of Labor Economics*, Vol. 1, Chapter 12, 641-692, Orley C. Ashenfelter and Richard Layard (eds.), Elsevier Science Publishers B.V., Amsterdam (1986).

Sabin, Lora, *The Development of Urban Labour Markets: China's Urban Wage Curve, 1980-92*. *The Journal of Development Studies* 35:3, 134-52 (1999).

Svejnar, Jan, "Labor market in the transitional Central European and East European Economies," *Handbook of Labor Economics*, vol 3b: 2809-2858. Orley Ashenfelter and David Card (eds.), Elsevier: Amsterdam (1999)

Wong, C., C. Heady and W. Woo, "Fiscal Management and Economic Reform in the People's Republic of China", Asian Development Bank, Oxford University Press, Hong Kong (1995).

Table 1: Urban Employment by Type of Enterprises and by Provinces (Percent, 1996)

Province (Capital City)	State-owned	Urban Collective	Shareholding	Foreign Joint Venture	Domestic Private	Proprietorship	Other	Total
All urban areas	56.74	15.22	1.83	2.73	3.13	8.62	11.73	100
Guangdong (Guangzhou)	49.54	16.92	2.2	11.38	7.83	11.56	0.57	100
Shanghai	61.06	16.01	5.32	7.59	7.61	1.43	0.98	100
Beijing	71.49	13.81	2.98	6.2	1.39	3.4	0.73	100
Jiansu (Nanjing)	58.77	26.34	1.98	4.2	2.63	4.73	1.35	100
Shichuan (Chengdu)	65.59	17.77	3.67	0.83	3.33	8.7	0.11	100
Hubei (Wuhan)	64.47	14.92	2.97	1.12	2.82	13.49	0.21	100
Jilin (Changchun)	62.35	17.28	1.62	1.42	2.77	14.48	0.08	100
Shanxi (Xi'an)	73.96	11.75	1.01	0.52	3.34	9.27	0.15	100
Guizhou (Guiyang)	73.72	11.2	0.72	0.68	3.85	9.45	0.38	100

Source: Yearbook of China, Real Estate Markets (1997)

Table 2: Population and Economic Development in Selected Provincial Capital Cities (1996)

Cities	Population (Thousand)	GDP per capita (RMB Yuan)	Per capita foreign capital invested (US dollar)
All Cities in China	515,113.2	9,139	81
Guangzhou	3,901.8	26,376	432
Shanghai	9,610.2	24,282	781
Beijing	7,374.0	18,345	169
Nanjing	2,693.8	18,971	131
Chengdu	3,171.2	13,728	22
Wuhan	5,172.5	13,182	97
Changchun	2,741.7	11,430	25
Xi'an	3,033.1	10,636	68
Guiyan	1,760.5	7,930	22

Source: Urban Statistical Yearbook of China (1997)

**Table 3: Average scale of monthly income of individual workers
by enterprise type and city.**

CITY	SOE	UCE	SHC	FJV	Income Scale	Gross Income (yuan /month)
Guangzhou	4.26	4.15	5.12	4.65	1	300 or less
Shanghai	2.98	2.63	5.29	5.63	2	301 - 600
Beijing	3.65	3.64	3.60	5.68	3	601 - 800
Nanjing	2.44	1.76	2.56	3.57	4	801 - 1000
Chengdu	2.60	2.04	3.05	2.38	5	1001 - 1200
Wuhan	2.25	3.89	2.38	1.81	6	1201 - 1500
Chanchung	2.51	2.56	3.01	2.84	7	1501 - 2000
Xi'an	2.47	1.72	4.02	3.17	8	2001 - 2500
Guiyang	2.01	2.16	2.66	2.85	9	2501 - 3000
Mean within-city Stdev	1.02	1.15	1.27	1.43	10	3001 or more
Between-city Stdev	0.72	0.93	1.08	1.40		

Source: authors' tabulation.

Figure 1: Definition of Income Scales

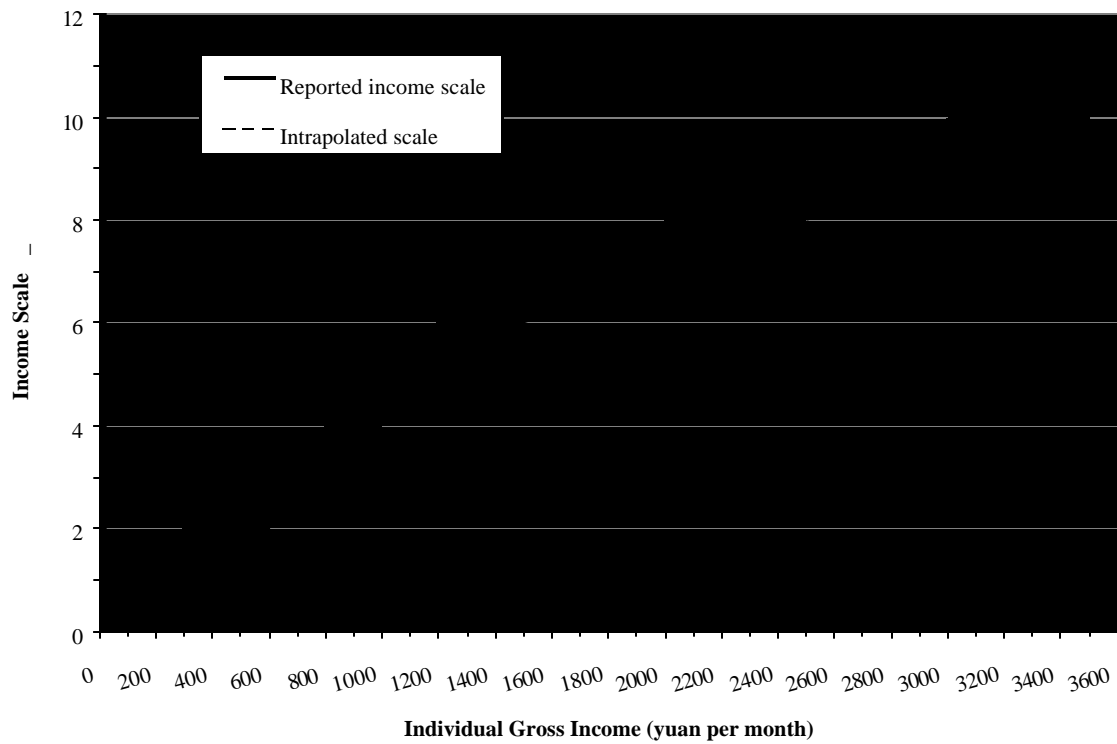


Table 4: Preference for the ownership type of the employer

Preferred ownership type (% of column)	Current employer type				Schooling					Overall
	SOE	UCE	SHC	FJV	Primary or lower Sch.	Middle Sch.	High Sch.	Tech. College	Univer -sity	
SOE	34.31	28.73	26.24	22.22	55.42	35.12	28.55	20.76	12.84	27.88
UCE	1.41	3.43	1.01	2.93	8.43	3.22	1.76	1.59	1.19	2.19
Sub total	35.72	32.16	27.25	25.15	63.86	38.34	30.32	22.34	14.03	30.07
SHC	14.73	17.84	20.38	19.09	9.64	15.32	17.57	21.86	21.19	18.01
FJV	35.32	32.86	38.35	40.30	18.07	30.44	36.66	42.49	46.57	36.71
Domestic private	3.53	4.03	4.34	2.22	4.82	4.10	2.94	3.91	3.58	3.53
Self-employment	7.97	10.48	7.16	8.48	2.41	9.66	10.05	5.98	5.07	8.53
Other	2.72	2.62	2.52	4.75	1.20	2.15	2.47	3.42	9.55	3.15
Total	100	100	100	100	100	100	100	100	100	100

Source: authors' tabulation.

Table 5: Distribution of the job-change likelihood response by ownership types

Job-change prospect	<i>Q</i>	SOE	UCE	SHC	FJV	All sector
Very unlikely	1	31.5%	33.8%	35.7%	27.6%	32.14%
Unlikely	2	42.4%	42.8%	43.0%	45.3%	43.37%
Not sure	3	15.7%	16.5%	15.7%	18.7%	16.68%
Likely	4	7.9%	5.4%	4.5%	7.3%	6.28%
Very likely	5	2.5%	1.4%	1.0%	1.2%	1.54%
Total		100%	100%	100%	100%	100.00%

Source: authors' tabulation.

Table 6: Average years of Schooling by the Type of Enterprises and by Region

Regions	SOE	UCE	SHC	FJV
High-income / coastal cities	11.11	10.77	11.77	11.67
Lower-income /interior cities	11.73	11.11	11.57	11.51
All workers in the sample	11.45	10.96	11.66	11.58

High-income/ coastal cities include Beijing, Shanghai, Guangzhou and Nanjing.

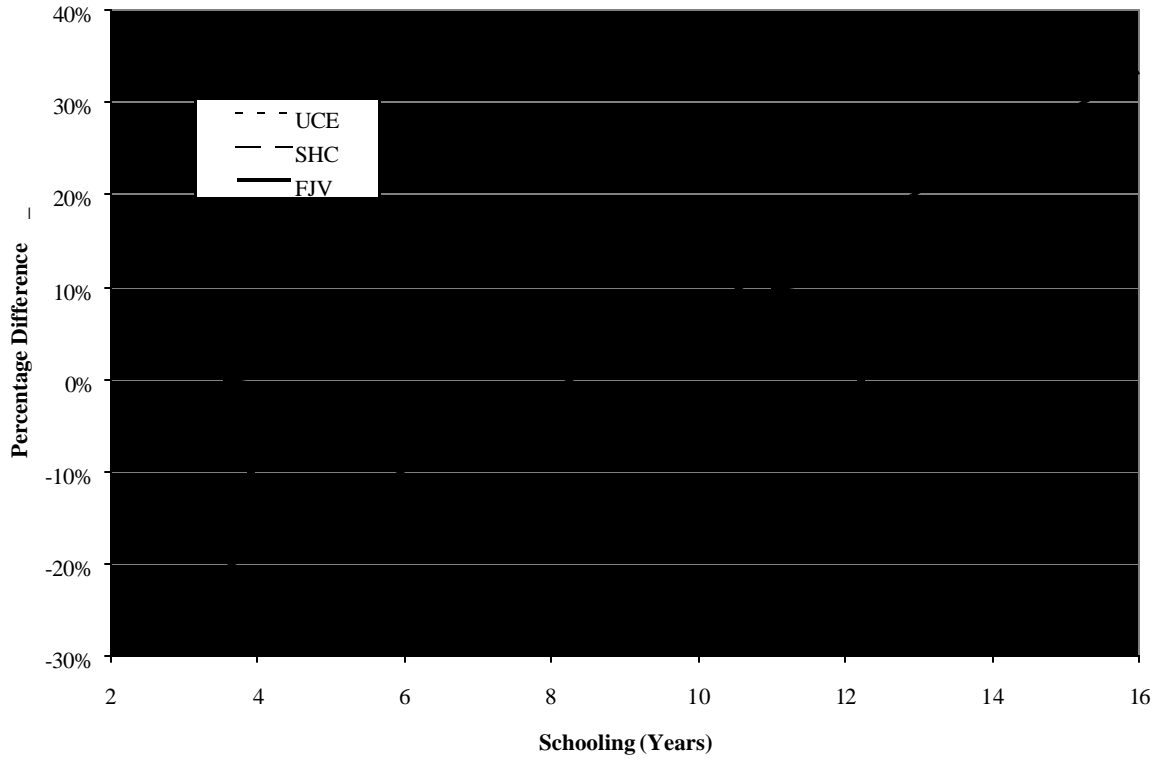
Source: authors' tabulation.

Table 7: OLS estimates of earnings equation

Dependent variable is individual monthly gross earnings Y . 3964 observations are included. t -statistics are based on White Heteroskedasticity-Consistent Standard Errors & Covariance. The regression includes city-ownership ($9 \times 4 - 4$) fixed effects (not shown in the table). Mean dependent variable is 3.17 (about 834 yuan). The percentage earnings differential shown in the last column is computed as the coefficient multiplied by 200 (the yuan difference of an increment on the Y scale around the sample mean) and divided by the sample mean earning of 834 yuan.

Independent variables	Coef	t -Stat	Coef	t -Stat	% of mean Y
<i>SCH</i>	0.0495	3.1	0.0524	3.2	1.3%
$(SCH - \text{mean}(SCH)) * FTUCE$	0.0659	3.1	0.0506	1.0	1.2%
$(SCH - \text{mean}(SCH)) * FTSHC$	0.0863	4.2	0.0550	1.3	1.3%
$(SCH - \text{mean}(SCH)) * FTFJV$	0.2127	7.4	0.1800	6.1	4.3%
$SCH * (LAYOF < 4)$	0.0214	5.1	0.0213	5.0	0.5%
$SCH * (FFNNC > 3)$	0.0212	3.5	0.0213	3.5	0.5%
$SCH * \ln(CFDIPC / \text{mean}(CFDIPC))$	0.0200	2.6	0.0195	2.6	0.5%
$SCH * \ln(CFDIPC / \text{mean}(CFDIPC)) * FTFJV$	0.0406	2.5	0.0406	2.5	1.0%
$\ln(AGE)$	0.8911	11.1	1.0446	11.0	25.1%
<i>MALE</i>	0.3564	9.3	0.3487	9.1	8.4%
$MALE * FTFJV$	0.3459	3.9	0.3865	4.3	9.3%
<i>MNGR</i>	0.5511	7.6	0.5503	7.6	13.2%
<i>JOBST</i>	-0.1107	-3.3	-0.1202	-3.4	-2.9%
<i>STOCK</i>	0.1842	4.5	0.1823	4.5	4.4%
<i>SAVNGS</i>	0.3697	10.1	0.3708	10.1	8.9%
$FSIZE - \text{mean}(FSIZE)$	-0.0058	-0.3	-0.0061	-0.3	-0.1%
$(FSIZE - \text{mean}(FSIZE)) * FTFJV$	-0.1858	-3.0	-0.1835	-3.0	-4.4%
$(FBNFT)^{0.4}$	-0.2000	-2.1	-0.1875	-1.9	-4.5%
$FAVWG / \text{mean}(FAVWG)$	0.2258	4.4	0.2296	4.5	5.5%
<i>FFNNC</i>	0.2900	9.1	0.2920	9.2	7.0%
$(FFNNC - \text{mean}(FFNNC)) * FTFJV$	-0.1918	-3.2	-0.1997	-3.3	-4.8%
<i>FTUCE</i>	-0.0228	-0.2	-0.0219	-0.2	-0.5%
<i>FTJSC</i>	0.2195	1.8	0.2367	1.9	5.7%
<i>FTFJV</i>	1.2309	2.9	1.2301	2.9	29.5%
$MR * FTSOE$			-0.0578	-0.2	-1.4%
$MR * FTUCE$			-0.2925	-0.3	-7.0%
$MR * FTJSC$			1.1672	0.9	28.0%
$MR * FTFJV$			1.6470	3.5	39.5%
<i>CONSTANT</i>	-2.0444	-4.8	-2.6173	-5.5	
R squared (Adjusted R squared)	0.596	(0.591)	0.598	(0.592)	
F statistics for dropping ($9 \times 4 - 4$) city-ownership fixed effects (probability)	30.2	(0.00)	30.3	(0.00)	

Figure 2: Differential Returns to Schooling (in Comparison with the SOE Sector)



Note: The earnings differential at the sample mean schooling (11.4 years) is computed as the ownership fixed effect plus the average of the ownership-specific city-level fixed effects. The differential at other levels of schooling is computed according to the differential returns to schooling pertaining to the sector (the coefficient of *SHC* and firm type interaction in terms of percentage of mean *Y*, as reported in the last column of Table 7).

Table 8: Binary probit estimation of employer-type choice equation

Dependent Variable is binary choice P (1 selects SOE or UCE as the preferred type of employers, 0 does not). 3964 observations are included; 1192 observations with $P = 1$. z-statistics are based on QML (Huber/White) standard errors & covariance.

Independent variables	Estimates with city-level fixed effects		Estimates with city-specific conditions	
	Coefficient	z-Statistic	Coefficient	z-Statistic
<i>SCH</i>	-0.0722	-6.6	-0.0632	-5.9
$\ln(\text{AGE})$	0.3291	3.3	0.3170	3.2
<i>LAYOF</i>	0.1387	4.4	0.1576	5.1
<i>JOBRST</i>	0.2181	4.7	0.1966	4.2
<i>JSHMTV</i>	-0.2901	-7.1	-0.3037	-7.5
<i>SPSSOE</i>	0.1178	2.6	0.1235	2.7
<i>FMINCM</i>	-0.0604	-3.8	-0.0683	-4.4
$(\text{FFNNCI} - \text{mean}(\text{FFNNCI})) * \text{FTSOE}$	0.1874	3.9	0.1729	3.7
$(\text{FFNNCI} - \text{mean}(\text{FFNNCI})) * \text{FTUCE}$	-0.0308	-0.7	-0.0118	-0.3
$(\text{FFNNCI} - \text{mean}(\text{FFNNCI})) * \text{FTJSC}$	0.0180	0.3	0.0281	0.5
$(\text{FFNNCI} - \text{mean}(\text{FFNNCI})) * \text{FTFJV}$	0.0052	0.1	0.0525	1.0
<i>FTUCE</i>	-0.1816	-2.9	-0.1721	-2.8
<i>FTJSC</i>	-0.2335	-3.7	-0.2248	-3.6
<i>FTFJV</i>	-0.2878	-4.5	-0.2841	-4.5
<i>CFJVS</i>			0.0550	8.2
<i>CONSTANT</i>	-1.0389	-2.3	-1.0252	-2.3
City-level fixed effects	Yes			
LR statistic	475.6	22 d.f.	392.7	15 d.f.
McFadden R-squared	0.098		0.081	

Table 9: Ordered probit estimation of the determinants of job-change prospects

The dependent variable is the ordered response Q , regarding a worker's job change prospect, reported on a 5-level scale (see Table 5 for the distribution of the response). 3964 observations are included. z-statistics are based on QML (Huber/White) standard errors & covariance. LR statistic (20 d.f.) is 642.4 and LR index (Pseudo- R^2) is 0.064.

The base-case probability is computed as the probability that a worker with base-value independent variables considers a job-change likely or very likely ($Q=4$ or $Q=5$); such probability is 7.99%. The marginal probability ΔProb is computed as the change from the base-case probability when an alternative value substitutes for the corresponding base value.

Independent Variables	Estimates		Marginal probability		
	Coefficient	z-Statistic	Base value	Alternative value	$\Delta\text{Prob.} / \text{Base Prob.}$
<i>SCH</i>	0.0252	2.9	12	14	10%
<i>Ln(AGE)</i>	-1.1690	-14.8	3.61	3.71	-20%
<i>MARRIED*(1-MALE)</i>	-0.1382	-3.7	0	1	-23%
<i>LAYOF</i>	-0.1253	-4.7	3.5	2.5	25%
<i>JOBRST</i>	-0.0740	-1.9	3.5	2.5	14%
<i>HSNG</i>	-0.0791	-3.3	3.5	2.5	16%
<i>HSNGST</i>	-0.0995	-2.5	0	1	-17%
<i>1-P</i>	0.1606	2.8	0	1	33%
<i>(1-P)*(FTSOE+FTUCE)</i>	-0.0247	-0.3	0	0	0%
<i>INCMUP</i>	-0.0332	-2.6	4	5	-6%
<i>FSIZE</i>	-0.0471	-2.8	6	6.1	-1%
<i>FFNNC</i>	-0.0906	-3.6	3	4	-16%
<i>FFNNC5</i>	-0.0630	-3.0	3	4	-11%
<i>CFIDPC/mean(CFDIPC)</i> <i>*(FTSOE+FTUCE)</i>	0.0626	2.2	1	2	12%
<i>CFIDPC/mean(CFDIPC)</i>	-0.0049	-0.3	1	2	-1%
<i>CGAP</i>	0.1023	2.7	-0.59	0	12%
<i>CGAP*FTSOE</i>	0.1717	2.3	-0.59	0	20%
<i>FTUCE</i>	0.0748	0.8	0	0	0%
<i>FTJSC</i>	-0.1380	-1.7	0	0	0%
<i>FTFJV</i>	-0.1194	-2.2	0	0	0%
Limit 1: d_1	-6.5561	-16.7			
Limit 2: d_2	-5.2774	-13.6			
Limit 3: d_3	-4.4676	-11.6			
Limit 4: d_4	-3.6675	-9.6			

Appendix I: Logit Estimation of the Selection of Workers to the Employment Sectors and the Computation of Inverse Mills Ratios

We follow the formulation in Gyourko and Tracy (1988) in applying the two-step correction procedure (Lee 1982) to account for the potential endogenous selection of workers to multiple labor market segments. The selection of worker i to a labor market segment, whether by the choice of the worker or the government, is assumed to be based on index functions with respect to alternative segments $I_{ij}^* = Z_i \mathbf{q}_j + \mathbf{h}_{ij}$, where Z_i is the vector of worker characteristics that affect the selection, \mathbf{q}_j is the coefficient vector with respect to segment j and \mathbf{h}_{ij} is the residuals. The selection outcome is determined by

$$I_i = j \text{ iff } I_{ij}^* \geq \max_{k \neq j} I_{ik}^* \text{ or equivalently iff } \mathbf{x}_{ij} \equiv \max_{k \neq j} I_{ik}^* - \mathbf{h}_{ij} \leq Z_i \mathbf{q}_j. \quad (\text{A1})$$

When the residual \mathbf{h}_{ij} are independent and follow the identical type I extreme-value distribution, the selection can be analyzed with a multinomial logit model:

$$\Pr(I_i = j) = \Pr(\mathbf{x}_{ij} < Z_i \mathbf{q}_j) = \frac{\exp(Z_i \mathbf{q}_j)}{\sum_{k=1}^4 \exp(Z_i \mathbf{q}_k)} \equiv F_j(Z_i \mathbf{q}_j) \quad (\text{A2})$$

In order to compute the expected earnings conditional on the selection outcome, we need to transform \mathbf{x}_{ij} into a standard normal random variable $\mathbf{x}_{ij}^* \equiv \Phi^{-1}[F_j(Z_i \mathbf{q}_j)]$, where Φ is the cumulative distribution of a standard normal variable (see Lee [1983]). The conditional expectation can now be evaluated using standard methods so that

$$\begin{aligned} E(Y_{ijk} | I_i = j) &= H_i \mathbf{a}_{ijk}^Y + A_i \mathbf{b}^Y + F_i \mathbf{l}_j^Y + \mathbf{g}_{jk}^Y + E\{\mathbf{e}_i^Y | \mathbf{x}_{ij}^* < \Phi^{-1}[F_j(Z_i \mathbf{q}_j)]\} \\ &= H_i \mathbf{a}_{ijk}^Y + A_i \mathbf{b}^Y + F_i \mathbf{l}_j^Y + \mathbf{g}_{jk}^Y + \mathbf{s}_j \mathbf{r}_j MR_{ij} \end{aligned} \quad (\text{A3})$$

where

$$MR_{ij} \equiv - \frac{\mathbf{f}\{\Phi^{-1}[F_j(Z_i \mathbf{q}_j)]\}}{F_j(Z_i \mathbf{q}_j)} \quad (\text{A4})$$

is the inverse Mills Ratio for worker i in segment j and \mathbf{r}_j is the correlation coefficient between \mathbf{e}_j^Y and \mathbf{x}_{ij}^* . In equation (A4), f is the probability density of a standard normal random variable.

The estimates of the multinomial logit model are reported in Table A1 and the summary statistics for the MR_{ij} are provided in Appendix II. The multinomial estimates indicate that schooling makes a worker less likely to be in UCE relative to other types of enterprises. Age decreases the likelihood for a worker to be in privatized or private enterprise relative to SOE and UCE. The workers who value income and promotion opportunities (high $JSHMTV$ scores) are slightly more likely to be in FJV. Finally, the workers who prefer SOEs to privatized and private enterprises are more likely to be in SOEs.

Table A1: Multinomial Logit Estimates of Labor-Market Segment Selection

The multinomial logit model is given by equation (A2). The coefficients for the SOE sector are normalized to zero. zstatistics are reported in parentheses. The number of observations for the estimation is 3964.

Explanatory variables Z	UCE	SHC	FJV
Constant	0.1759 (0.3)	-0.3874 (0.7)	0.0152 (0.0)
<i>SCH</i>	-0.0969 (4.5)	0.0220 (1.1)	-0.0071 (0.3)
<i>AGE</i>	0.0001 (0.0)	-0.0088 (1.8)	-0.0225 (4.3)
<i>JOBST</i>	0.1194 (1.4)	0.0873 (1.0)	0.1096 (1.3)
<i>JSHMTV</i>	0.1323 (1.6)	0.0618 (0.7)	0.1554 (1.9)
<i>P</i>	-0.2499 (2.5)	-0.3563 (3.5)	-0.4463 (4.4)

Appendix II: Description of the variables and their sample statistics

Variable	Description	Sample mean (standard deviation)			
		SOE	UCE	SHC	FJV
<i>Y</i>	Personal monthly gross earnings: reported in scale 1 to 10; see Table 4 for definition.	2.80 (1.24)	2.73 (1.51)	3.52 (1.66)	3.62 (1.98)
<i>P</i>	Binary choice of preferred employer type: 1 = selecting SOE or UCE; 0 = selecting others.	0.36 (0.48)	0.32 (0.47)	0.27 (0.45)	0.25 (0.43)
<i>Q</i>	Ordered response of job-change likelihood: 1=very unlikely, ... 5=very likely.	2.08 (1.00)	1.98 (0.92)	1.92 (0.88)	2.09 (0.92)
<i>SCH</i>	Schooling in year: 3=below primary, 6=primary, 9=middle sch, 11=high sch, 14=tech. college, 16=university or above.	11.45 (2.21)	10.96 (2.25)	11.66 (2.47)	11.58 (2.35)
<i>AGE</i>	Age in years	38.60 (9.23)	38.91 (8.94)	37.54 (9.65)	36.45 (9.03)
<i>MALE</i>	Gender: 1 = male; 0 = female.	0.55 (0.50)	0.46 (0.50)	0.50 (0.50)	0.49 (0.50)
<i>MARRIED</i>	Marriage status: 1=married; 0=not married.	0.82 (0.38)	0.85 (0.36)	0.81 (0.39)	0.81 (0.39)
<i>MNGR</i>	Job position: 1 = manager; 0 = non-manager.	0.09 (0.29)	0.09 (0.29)	0.09 (0.29)	0.09 (0.29)
<i>LAYOF</i>	Importance of layoff protection: 1=very unimportant, ... 5= very important.	4.07 (0.83)	4.09 (0.85)	3.95 (0.86)	4.11 (0.85)
<i>DISTN</i>	Importance of going to work close home: 1=very unimportant, ... 5= very important.	3.66 (0.81)	3.73 (0.82)	3.68 (0.80)	3.68 (0.86)
<i>PRESR</i>	Importance of low job pressure: 1=very unimportant, ... 5= very important.	3.51 (0.88)	3.57 (0.89)	3.55 (0.87)	3.56 (0.89)
<i>SECUR</i>	Importance of job security: 1=very unimportant, ... 5= very important.	4.31 (0.62)	4.40 (0.63)	4.29 (0.63)	4.31 (0.63)
<i>JOBRST</i>	Job preferences: (ADISTN+APRESR+ASECUR)/3; 1=very flexible, ... 5=very restrictive.	3.83 (0.57)	3.90 (0.56)	3.84 (0.56)	3.85 (0.57)
<i>HSNG</i>	Importance of getting housing from employer: 1=very unimportant, ... 5= very important.	4.07 (0.82)	4.07 (0.87)	4.10 (0.80)	4.05 (0.82)
<i>INCOM</i>	Importance of getting high salary: 1=very unimportant, ... 5= very important.	4.37 (0.64)	4.47 (0.63)	4.40 (0.61)	4.45 (0.59)
<i>PROMT</i>	Importance of promotion opportunities: 1=very unimportant, ... 5= very important.	3.58 (0.87)	3.60 (0.90)	3.62 (0.82)	3.66 (0.83)
<i>JSHMTV</i>	Job-search motivation: (AINCOM+APROMT)/2; 1=1=very unimportant, ... 5= very important.	3.97 (0.59)	4.03 (0.60)	4.01 (0.57)	4.05 (0.57)
<i>INCMUP</i>	Income change during the past year: reported in scale 0 to 9; 0=over 50% reduction, 9=over 100% rise.	4.24 (1.50)	4.16 (1.60)	4.48 (1.51)	4.50 (1.57)
<i>FMINCM</i>	Family monthly gross income, reported in scale 1 to 9; 1=600 yuan or less, ...9=5,000 yuan or more.	3.30 (1.58)	3.10 (1.67)	3.63 (1.67)	3.82 (1.91)
<i>SPSSOE</i>	Spouse's employer: 1=employed by SOE, public utilities, or government offices; 0=no spouse so employed.	0.55 (0.50)	0.43 (0.50)	0.47 (0.50)	0.43 (0.50)
<i>HSNGST</i>	Housing status: 1=occupying employer-provided housing; 0=occupying other types of housing.	0.37 (0.48)	0.29 (0.45)	0.39 (0.49)	0.28 (0.45)

<i>STOCK</i>	Invested in stocks: 1=yes, 0=no.	0.24 (0.43)	0.23 (0.42)	0.38 (0.49)	0.24 (0.43)
<i>SAVNGS</i>	Increased savings balance: 1=yes, 0=no.	0.41 (0.49)	0.44 (0.50)	0.50 (0.50)	0.54 (0.50)
<i>FFNNC</i>	The current financial condition of the employer: 1=very poor, ... 5=very good.	2.65 (0.78)	2.74 (0.92)	3.14 (0.81)	3.00 (0.78)
<i>FFNNC1</i>	Expectation of the employer's financial condition in a year: 1=very poor, ... 5=very good.	2.92 (0.88)	3.07 (0.97)	3.36 (0.84)	3.24 (0.85)
<i>FFNNC5</i>	Expectation of the employer's financial condition in 5 years: 1=very poor, ... 5=very good.	3.27 (0.94)	3.37 (1.01)	3.62 (0.89)	3.48 (0.92)
<i>F SIZE</i>	Firm size: log of the number of active employees.	6.32 (1.11)	5.31 (0.78)	6.99 (1.20)	5.67 (1.04)
<i>FBNFT</i>	Firm's spending on employee benefits (not including housing) as % of total wages. Censored at 0.6 (2.8% cases exceed 0.6).	0.19 (0.15)	0.16 (0.18)	0.14 (0.13)	0.13 (0.11)
<i>FAVWG</i>	Average wage rate at the firm.	458 (177)	379 (171)	611 (260)	726 (330)
<i>FTSOE</i>	Firm type: SOE	1.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
<i>FTUCE</i>	Firm type: UCE	0.00 (0.00)	1.00 (0.00)	0.00 (0.00)	0.00 (0.00)
<i>FTSHC</i>	Firm type: SHC	0.00 (0.00)	0.00 (0.00)	1.00 (0.00)	0.00 (0.00)
<i>FTFJV</i>	Firm type: FJV	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	1.00 (0.00)
<i>CFDIPC</i>	City economic status: foreign direct investment per capita according to Table 2.	195 (241)	195 (241)	195 (241)	194 (240)
<i>CFJVS</i>	City economic status: FJV share of employment according to Table 1.	3.77 (3.65)	3.78 (3.65)	3.77 (3.65)	3.77 (3.65)
<i>CGAP</i>	City-specific earnings gap between the FJV and the SOE sectors.	-0.59 (0.56)	-0.59 (0.56)	-0.59 (0.56)	-0.59 (0.56)
<i>MR</i>	Inverse Mills Ratio	-1.26 (0.10)	-1.25 (0.12)	-1.27 (0.07)	-1.26 (0.11)
No. of obs		991	992	992	990

Appendix III: Survey Method

Sampling

3964 respondents from 180 firms in nine cities participated in the survey. They were recruited through a multi-stage sampling procedure. The sampling frame of the first stage consisted of all Chinese mainland cities of provincial capital or with provincial status. They were grouped into three tiers based on their per capita income in 1996. Three cities were selected from each tier; they were: Beijing, Shanghai, and Guangzhou (high income); Nanjing, Wuhan, and Chengdu (medium income); and Changchun, Guiyang, Xi'an (low income).

In the second stage, the manufacturing firms with 100 or more employees in each of the nine cities were classified into four types by ownership structure—state-owned, collective-owned, shareholding, and Chinese-foreign joint venture—according to the 1996 national industrial statistical data bank supplied by the Chinese Statistical Bureau. 20 firms were randomly selected among each type. Only the manufacturing sector is covered because in other sectors fewer types of ownership existed. After eliminating the firms that declined survey, went out of business, located too far away from the city center to be reached by our field interviewers, or did not have a large enough number of the middle level managers required by our sample criteria, 78.3% of the randomly selected firms were included in the final sample. The remaining number of the firms in the final sample was selected by the firm conducting the field interviews, with the balance in enterprise types, industrial sectors, and location distribution taken into account.

In the final stage, 22 employees were selected from the employee list supplied by the personnel department of each firm, excluding the employees from such “side-line” departments as firm-run kindergarten or hotel who had little to do with the firm’s main line of business. Among the 22 interviewees, one was a personnel manager, one marketing manager, 10 randomly selected middle-level managers, and 10 randomly selected non-managerial employees. The total sample also include four extra employees from different firms interviewed in Shanghai

Data Collection

The data were collected in a 6-week time period from November 17 to December 26, 1997.

Firm Level Data. Firm level data were first obtained from a questionnaire completed by the personnel manager. They were then verified according to the data available from the previously mentioned national industrial statistical data bank. In the few cases where discrepancies were found, we use the data from the data bank because it had been officially audited.

Individual Level Data. Individual data were collected through face-to-face interviews. A major market research company in Beijing with branches in all of the nine cities studied was commissioned to carry out the interviews.