

Wage Determination and Returns to Education
in Urban China, 1995

by

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Abstract

This paper examines wage determination and returns to education in urban China, using the most recent available micro-level data from the Chinese Household Income Project 1995 released by “The Inter-university Consortium for Political and Social Research (ICPSR)”. The results suggest that wage premiums for communist party members, for permanent employees, for individuals working in foreign enterprises and in the finance and insurance sector, and for people living in coastal regions are remarkably high.

This paper compares the rates of returns to education from the 1995 sample with those based on the 1988 sample of ICPSR in Maurer-Fazio (1999). The Mincer-type rates of return to schooling are estimated at 4.1% for males and 5.4% for females in 1995 urban China. These results show that in post-reform China, the returns to education have increased in a slow way. Furthermore they are on average low compared with other well-functioning labour markets. In addition, a series of analyses on age cohorts, regional clusters and ownership sectors reveals that people under age 30, living in the poor central and west areas, or working in the private sector are rewarded significantly more on schooling years than the remaining groups.

Wage Determination and Returns to Education in Urban China, 1995

1. Introduction

China is playing a growing role in the world economy. There is an increasing interest amongst scholars and commentators in its economy. In particular, as the most populous country and the largest potential employment market in the world, issues related to China's labour market have attracted wide attention. Is the wage determination process in China close to economists' predictions? Are returns to education higher or lower than those found elsewhere? Do the key characteristics of labour market segmentation differ between men and women? These classical questions in labour economics are well worth studying in China nowadays, even though they have been studied in most developed countries for many years.

The purpose of this paper is to analyze the basic characteristics of wage determination in Urban China and the returns to education, using a 1995 micro-level dataset which was released at the end of 2000 by The Inter-university Consortium for Political and Social Research (ICPSR). Given the uneven development across China between urban and rural areas and the inapplicability of the individual dataset in rural area, I restrict my work to urban areas. Maurer-Fazio (1999) presented empirical evidence on the relationship between earning and education in China's transition to a market economy based on 1989 and 1992 datasets. This paper uses a similar method in

order to analyze the returns to education in 1995.

This paper addresses the following issues. Firstly, the rates of return to schooling years in China maybe higher than those reported previously since individuals in a market economy are in theory paid according to their productivity and therefore would earn higher rewards stemming from education (Nee, 1989). Secondly, while the wage determination process in China resembles the process in other countries, it has its own characteristics related to special cultural, economic and political factors. Third, the rates of return to education may vary across different groups of workers on the basis of age, sex, region and the type of firm, because of differences in their respective statuses with respect to economic development and penetration of market forces.

I carry out my empirical study according to the following outline:

- (1) A descriptive analysis of the means of earnings and of the variables related to the earnings for the different groups;
- (2) Estimates of the wage determination process and the rates of returns to education for the whole sample by gender, using different regression models;
- (3) An analysis of the effects of important characteristics on earnings in China's urban areas, such as marital status, communist party membership, type of firm, regional division and so on;
- (4) An examination of the effects of years of schooling on earnings for different age cohorts, ownership sectors, and regional groups.

The paper is structured as follows. In the next section a brief literature review is

presented. The third section presents the data source and the descriptive statistics. The fourth section presents the empirical models. The regression results are analyzed in the fifth section. The final section contains a summary and a conclusion.

2. Previous Empirical Research

During the 1980s, China's economy like many other centrally planned economies instituted a program of market-oriented economic reform (Meng and Kidd, 1997). Meng and Kidd thought that "the essential objective of these programs was to increase efficiency and, thus, help speed up economic development" (p.404). They also claimed that, instead of the "big bang" variety, China's economic reform followed a piecemeal pattern, in which marketization started from the goods and services market and then spread to the factor markets, including the labour market. For an investigation of the impact of the labour market reforms and comparisons in the changes to the rates of return to education over a long period, one would like to analyze of returns to education during the pre-reform era. Meng and Kidd (1997) carried out such a comparison. They used individual data for 1981 and 1987 in Chinese state-owned sector to examine changes in wages over the reform period and to evaluate the impact of the first installment of the reform program. They interpreted the 1981 results as an approximate representation in the pre-reform period¹ and found that China had a very low 2.5% rate of return from an

¹ It is widely recognized that the economic reform in China started from 1979 and it did not significantly influence the urban areas until 1984.

additional year of schooling relative to other countries, such as 5% in the U.S. and 7.1% in the U.K (p.412, Table 3). The rates of return to education increased only slightly in 1987 to 2.7%, but the authors found that there was evidence of a structural change in the system of wage determination due to changes in industrial wage differentials. They also reported that wages were determined mainly according to education, experience, and occupation in that period based on a very high value for adjusted R-square 0.64, which showed that 64% of the wage variation can be explained solely by these three personal characteristics either in 1981 or in 1987. Meng and Kidd also reported that “adjusted R-squares are on the order of 20% to 40% in the studies of most industrialized and developing market economies” (p.411). Furthermore, they found a continuous upward-sloping (non-concave) experience-earnings profile, which they interpreted as a relationship between seniority and earnings instead of a link between productivity and wages.

Jamison and Van Der Gaag (1987) used 1985 data from a household survey conducted in a relatively poor county in north western China (Hui County, Gansu Province) to assess the impact of education on the earnings of urban residents. They asserted that the Mincerian rate-of-return to schooling was 4.5% for urban males and 5.5% for urban females, and claimed that these results were remarkable low. They also found that the effect of work experience on the earnings was also surprising low for males and even negligible for females in their sample.

Johnson and Chow (1997) estimated rates of return to education in both rural and

urban areas using datasets from Chinese Household Income Project 1988 (CHIP-88). They reported that the Mincer-type rates of returns were 4.0% in the rural areas and 3.3% in the urban areas, which are low compared with those elsewhere². They considered that the lower rate of returns to education in urban areas may have been caused in part by the nature of employment in the public sector. They also found that, while non-communist party members in the urban areas had lower wages than communist party members, the rates of returns to schooling for the former were significantly higher. They claimed that “this difference may be caused by the nature of employment within the party where the wage structure may be based on seniority and relationships, rather than on productivity and quality of human capital” (p.110) and “another possible explanation is that Communist Party membership enables a person to get education with perhaps fewer qualifications” (p.110).

Liu (1998) also provided some estimates on the rate of return to education in urban China using CHIP-88 and found that the rate of return to education ranged from 3% to 6%, and that the effect of each additional year of work experience was 5%. He claimed that it was much lower than the average estimated rate of 14.4% documented for Less Developed Countries (LDC), to which China belongs. He also revealed that the return to education appeared to be higher in Guangdong province. As a pioneer in economic reforms, this province carried out a series of aggressive labour reform programs and then

² They estimated the rates of returns to education were 4.46% for females and 2.78% for males by adding an interaction term “female*schooling” to their basic mode for the whole urban individual sample.

developed a new market-oriented labour employment system that rewards education. Liu further estimated the direct effects on earnings and the returns to education of the labour contract system³ and the floating wage scheme⁴. He then found that there are positive and significant associations between earnings and these two reform programs, and the floating wage scheme had raised the rate of return to education significantly.

Maurer-Fazio (1999) analyzed changes in the rates of return to educational attainment during China's process of economic transition using two large data sets, one in 1988 for the Chinese Household Income Project (CHIP-88) by ICPSR, and the other in 1992 for the Chinese Labour Market Research Project (CLMRP). ICPSR also implemented the 1995 survey and tried to conform to the categories of the 1988 datasets "although changes in China's economic organization have eliminated some categories and the improvement in the survey questionnaire has made it possible to achieve disaggregation of certain other categories" (Riskin, Zhao and Li, 2000, p.35 of Codebook and Data Collection Instrument). This makes possible to compare my results, presented below, with hers. In her paper, Maurer-Fazio indicated firstly that several studies based on data before 1988 had reported surprisingly low rates of returns to education. The main reason for this is the pre-reform labour system in China, which "bureaucratically assigned

³"Under the labour contract system, the contract drawn between worker and firm specifies the duration of the agreement; the responsibilities, powers and benefits of the respective parties, including wages fringe benefits, labour insurance, nature of the work and required productivity standards; and the terms for renewal or termination. This reform, on the one hand, has increased the discretionary powers of managers over their work force, in particular, strengthening their ability to dismiss workers and, on the other hand, has given workers freedom to quit their current jobs and seek other employment opportunities". See Liu (1998), page 710.

⁴ "Under a floating wage system part of a worker's standard wage and bonus becomes a "floating wage" that is then paid on the basis of his or her performance. The floating wage could represent as much as 50% of a worker's total wage income." See Liu (1998), page 710.

urban workers to enterprises where they remained for a lifetime” (p.18), and the wage compression system which was “designed to provide egalitarian incomes for workers” (p.18). After industrial reforms had emerged, the labour market and the education system changed significantly, and thereafter the job assignment system was effectively dismantled. Thus she expected an increase of the returns to education, especially for the regions that had longer and more widespread market experiences and for the workers with more education and more ability, who could take advantage of the opportunities provided by the reform environment.

In her empirical work, Maurer-Fazio obtained a series of rates of return to education for her urban sample by estimating a basic form of earnings functions in the spirit of Mincer (1974). Her main findings include an estimated 2.9% rate of return for urban males and a 4.5% rate of return for urban female in the 1988 CHIP sample. Results based on the 1992 CLMRP data reveal estimated general returns to education of 3.7% for males and 4.9% for females. She also compared the rates of return to education by age cohort, ownership sectors, regions, and time periods. She then claimed that significant changes in the rewards to human capital accumulation commenced quite early in the urban reform process. Returns to education for young people, collective, joint venture and private-sector workers, and workers with new positions and in recently established firms increased in the late 1980s and early 1990s to a range that one would expect in East Asian market economies with a well-functioning labour market, such as 6.1% for Hong Kong, 6.5% for Japan and 6.0% for Taiwan.

Li (2003), using the Chinese Household Income Project 1995 (CHIP-95), the same data set used in this paper, estimated returns to education in China. She improved her estimates by using hourly wages and actual job experience and showed that returns to education had increased as China moved to a market system. The rates of return in 1995 were 5.4% for all workers, 4.3% for males, and 6.9% for females, which were considerably higher than the estimates from previous studies, especially those during pre-reform era. She claimed that the low overall rate of return to education was mainly caused by the low return to an elementary school education. She showed that the state-owned sector rewarded the lower education groups the most while private sector rewarded the highly educated groups the most. She also concluded that the returns to education were higher in the less-developed provinces than in the more developed provinces.

Although many empirical researchers have already analyzed the returns to education in urban China, most of them used earlier or smaller data sets. Only one published study, Li (2003), investigated returns to education in China using CHIP-95. But she focused mainly on the pooled sample for males and females. Moreover, the returns to education in China vary very much in different cases due to complicated political and economic situations of China and different points of view from researchers. Therefore, the study of this topic is still interesting and meaningful, also offering important policy implications.

3. Data and descriptive statistics

3.1. The data

The third wave of a large, micro level data set gathered by the Chinese Household Income Project 1995 (CHIP-95) (Riskin, Zhao, and Li, 2000) is used in this paper⁵. It includes 21698 individuals in 6931 households residing in 11 of China's 29 provinces. The CHIP data were drawn from the State Statistical Bureau's panel of approximately 35,000 urban households in a way intended to produce a representative sample of urban households.

The sample used here consists of 11565 individuals, 47.4% of which are females, and includes workers aged 16-60 with positive labour-related income and employment in 1995⁶. The sample excludes full-time students, homemakers, retired workers and workers who are disabled, injured, had chronic disease, or had similar disabilities. The source of income includes all types of wages and bonuses, all types of subsidies and allowances, and the value of income-in-kind.

The variables used in these analyses are defined in Table 1. The variable "school" is an important factor of human capital and is used to measure educational attainment. In this paper, I define the variable "school" to be total number of years of schooling reported in the dataset rather than the estimated one from education levels such as elementary, junior etc, which is used in the Maurer-Fazio's paper (1999). The variables "exp" and

⁵ There are 4 waves in this data set: rural household data, rural individual data, urban individual data, urban household data.

⁶ I set this age range since in China employment age for male is from 16 to 60 by law and it is from 16 to 55 for females. This information came from the department of labour and social security of China. (in Chinese)

“exp1” measure reported work experience and estimated work experience respectively. Most researchers use estimated work experience because experience is not observed directly. An advantage of this data set is that it offered detailed information about work experiences, so that I could compare the regression results using reported work experiences with those using estimated work experiences. The dummy variable “nonmar” distinguishes individuals who are never married from those who have other marital statuses. Another dummy variable “party” is used to identify the individuals who were members of the communist party, which could affect earnings in China. The variable “lnthours” represents the natural logarithm of total working hours in 1995.⁷ The dummy variable “ethnic” is used to identify the individuals who are national ethnic minority⁸.

The category of variables called “nature” is mainly used to describe the different natures of primary employment. I specify all individuals into 4 groups: those with permanent employment, long-term contract workers, temporary or short-term contract workers, or private or individual enterprise proprietors. I choose those with permanent employment as the reference group.

The type of ownership of the workplace and economic sector also affects earnings. I combine some variables into 4 more aggregated workplace ownership measures and 10 economic sectors respectively.⁹

⁷ The data set did not provide total working hours in 1995 directly but actual number of work hours on an average day and average number of work days per week in 1995. I get the product of these two numbers and then multiply this number by 52 to get the estimated working hours in 1995.

⁸ The Han Nationality is in the great majority among all nationalities of China. Other nationalities are viewed as the national ethnic minority in China.

⁹ The detailed information can be found in Table 1.

Region is also a very important factor that can affect earnings for Chinese urban residents. In Table 2, the ten provinces and one large metropolitan area (Beijing) contained in the sample are grouped under three regions: The Eastern or Coastal Region, The Central Region, and The Western Region.¹⁰ The Eastern region covers 12 provinces and accounts for about 14% of China's land mass and 40% of its population. It commenced economic development before many other regions and is rich in high-quality labour resources. China's central and western regions cover 19 provinces and account for about 86% of China's land mass and 60% of its population. In contrast to the eastern coastal region, the central and western regions are relatively backward in infrastructure such as transportation and telecommunications, and relatively primitive in the level of their economic development. In 2001, they accounted for only 33.84% of the country's GDP¹¹.

3.2. Descriptive statistics

The mean values of all the variables used in the regression for all individuals, both male and female, are presented in Table 3. A comparison of sample means reported in Maurer-Fazio's paper to those in my data set reveals some of similarities and differences between the selected CHIP samples of 1988 and 1995. The workers in the 1995 sample are a little bit older and have more work experience than those in the 1988 sample.¹²

¹⁰ This division was established since the Seventh Five-Year Plan of China in 1986.

¹¹ The information comes from "China Business Guide" in the website of China Council for the Promotion of International Trade, http://www.ccpit.org/static_ccpit/en/guide.jsp.

¹² The mean age of male workers in the 1988 sample, 38.6 years, is 1 year younger than that in the 1995 sample. Female employees in 1988, with a mean age of 35.5 years, are 1.5 years younger than those in the 1995 data. Males and females in the 1988 version have mean values of 10.7 and 10 years of schooling respectively, or 0.3 years and 0.4 years less schooling than in the 1995 version. See Maurer-Fazio (1999), page 23.

Reported work experience and the estimated one in the 1995 sample are shown in Table 3.¹³ The estimated or potential work experiences in the 1995 sample are higher than those in the 1988 sample, and they also exceed years of actual work experiences reported by respondents in the 1995 survey.¹⁴ The estimated years of work experiences in the samples of 1995 and 1988, the reported years of work experience in 1995 are 21.4 years, 20.9 years and 20.6 years for males, and 19.6 years, 18.5 years and 17.8 years for females. Since there exist some special cases, such as time spent waiting for a job, or time spent to deal with events of life, the estimated years of work experiences are always longer than those reported (or actual years of work experiences). One could note that the difference between the estimated years of work experience and the reported work experience for females is 1.8 years, which is larger than 0.8 years of those for males. It is more likely for females to interrupt their work due to child birth and rearing. The percentage of the sample that is ethnic is a little bit higher in the 1995 data than in the 1988 one¹⁵. The ratios of communist party members for females are 15.3% in the CHIP-95 and 11.7% in the CHIP-88. However, these ratios for males are relatively stable: 33.7% in 1995 and 34.3% in 1988. To some extent, this shows that the females in China gained stronger power in politics over time.

The greatest difference between these two samples lies in the values of annual income.

¹³ Maurer-Fazio provided only the potential experience, not the reported experience, in her paper. For comparison purposes, the proxy of estimated work experience in my paper is age - schooling - 7, which is the same as that in Maurer-Fazio's.

¹⁴ Years of potential experience in her paper are 20.95 for males and 18.45 for females respectively.

¹⁵ The percentages of minorities in 1989 data are 3.79 for males and 3.61 for females. I think this increase is due to the improvement of the survey range.

The mean annual incomes are 6229 Yuan for all individuals, 6737 Yuan for male workers, and 5663 Yuan for female employees in the 1995 sample, which are about 3 times larger than those in 1988 data. These big differences are partly due to inflation during those years. I believe there are also different measurements for income in the 1988 version and the 1995 version, but I can not identify the unavailable information to the 1988 dataset. My estimates for annual income are close to those of Li (2003), which is 6132 Yuan for the overall average earnings for all individuals (p.319).

Although educational attainments are classified slightly differently in these two surveys, it is clear that a lower percentage of respondents in the 1995 sample had their highest educational attainment at the junior high school level or below. Thus, the number of males and females who completed senior or vocational high school, vocational college, and university or above is much higher in the 1995 sample than the earlier sample.¹⁶

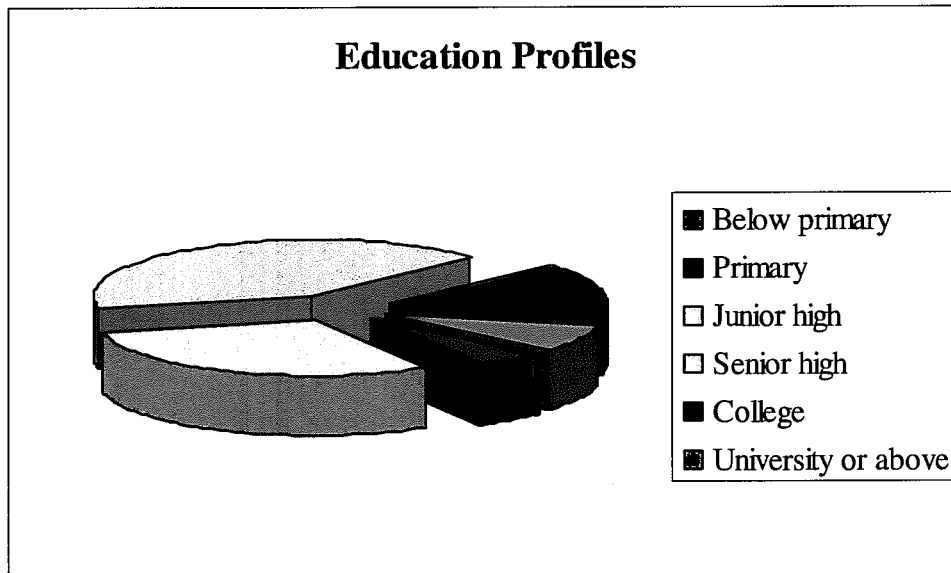
The CHIP-95 sample shows an increase in the proportion of state-owned enterprises and a decrease in the ratio of collectively owned firms compared to the 1988 sample.¹⁷ However, the survey categories of employment tenure and economic sector are a bit different in the two samples, making direct comparisons difficult. Nevertheless, it appears that the 1995 data show a greater proportion of workers who were not permanent or long-term employees and worked in the sectors of public utilities, consulting services,

¹⁶ In the 1995 sample the percentage of workers who completed senior high school or above is 67.7% for male (compared with 52.3 % in the 1988 sample) and 62.2% for female (compared with 45.2% in the 1988 sample).

¹⁷ There are 2% and 5% increases for males and females in the proportions of state-owned enterprises and 3% and 7% decreases for male and female in the proportions of collectively owned enterprises.

finance and insurance, and government than in the 1988 sample.¹⁸

Figure 1

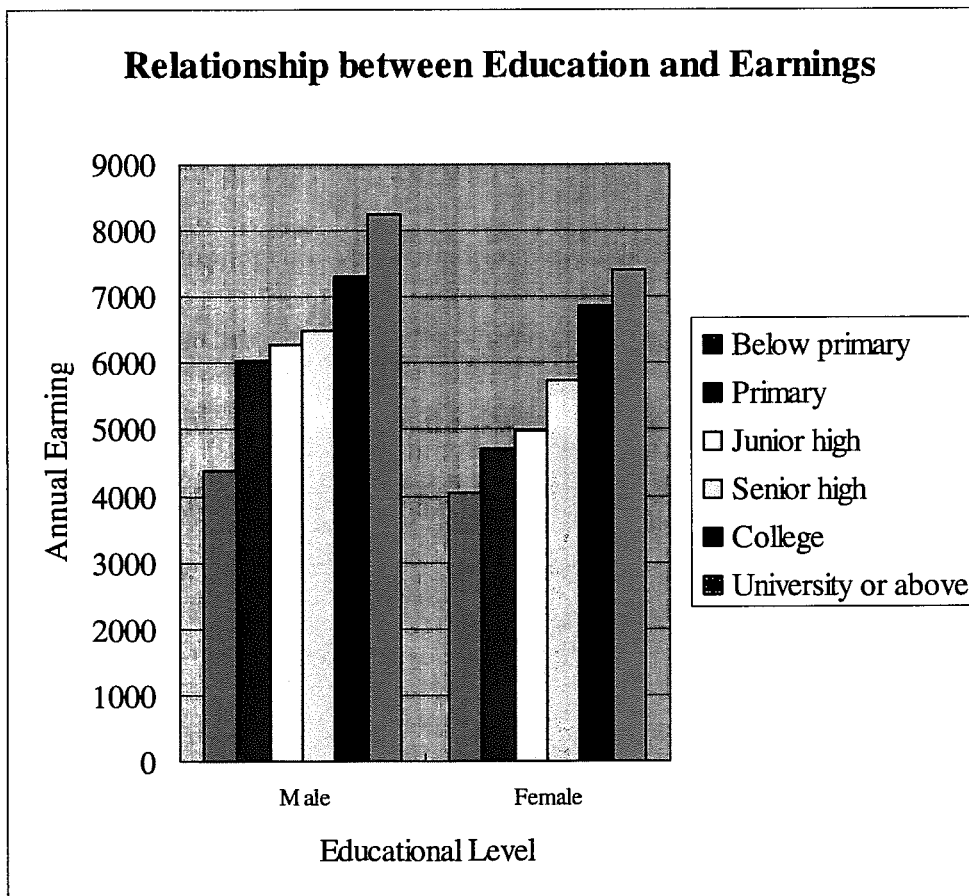


I divide the sample into different groups in order to explore variation in the returns to education. The mean values of earnings for all groups cross-tabulated by educational level, age, region, and workplace ownership are shown in Table 4. The important dimension is educational level. The education profile and the relationship between education and earnings are shown in Figure 1 and Figure 2 respectively. In Figure 1, I divide the whole sample including males and females into different groups based on educational level using a pie chart. About 71% of the respondents in this sample had their highest educational attainment at the junior and senior high school level. Only 0.36% of

¹⁸ 3.34% for males and 5.06% for females in the 1995 sample are not permanent or long-term workers (compared 1.47% for males and 3.06 for females in the 1988 sample). 19.1% for males and 16.3% for females in the 1995 data were working in the sectors of public utilities, consulting services, finance and insurance, and government (compared 15.2% for males and 9.2% for females in the CHIP-88).

the sample did not complete their elementary education (We don't even see this part clearly in the pie chart). In figure 2 I show the relationship of education and earnings, and it is clear that mean earnings increase with educational level. The graph therefore shows that returns to schooling are very important even before the application of regression analyses. One could also find that the earnings of males at each educational level are higher than the income of females at the respective level from the graph. It is certain that there exist gender wage gaps in China's labour market.

Figure 2



A noticeable point from the Table 4 is that although more than 75% of the

respondents in this sample had their highest educational attainment at the senior high level or below, the mean earnings of the individuals at even senior high level are less than the average earnings of all. To some extent, this shows that the gap between the high-income group and the low-income group is remarkable. Other results listed in the Table 4 indicate that those above age 50, living in eastern region, and working in private or foreign enterprises earn more than the remaining groups.

4. Empirical models

In the method widely used for the study of wage determination process, set out in Mincer (1974), the natural log of current earning is regressed on years of schooling, years of work experience and squared years of work experience. The coefficient of the total years of schooling can be interpreted as the average (private) rate of return from an additional year of schooling. Based on a substantial amount of empirical literature that adds a number of control variables to the specification of the regression equation, I develop two alternative models: the basic one and the extended one.

The basic model follows Mincer's basic equation and adds only three other variables to control for differences in gender, marital status and working hours:

$$\ln(\text{earn}) = \beta_0 + \beta_1 \times \text{school} + \beta_2 \times \text{exp} + \beta_3 \times \text{exp sq} + \beta_4 \times \text{nonmar} + \beta_5 \times \text{fem} + \beta_6 \times \ln(\text{thours}) + u$$

Applying OLS on the model for the samples of all individuals, men and women respectively, yields a series of results shown in Table 5. The experience variable is the

reported work experience. Then, in order to compare with other studies, I reestimate these equations in order to examine the effect of the proxy of on-the-job training by substituting the estimated or potential work experience.

In addition to the variables included in the basic model, wages may also be affected by variables related to individual status and current market conditions. Therefore, a number of other dummy variables are added to form the extended model, controlling for Communist Party membership, ethnicity, workplace ownership, nature of employment, economic sector, and region of residence. The specification of the regression equation is¹⁹:

$$\begin{aligned} \ln(\text{earn}) = & \beta_0 + \beta_1 \times \text{school} + \beta_2 \times \text{exp} + \beta_3 \times \text{exp sq} + \beta_4 \times \text{nonmar} + \beta_5 \times \text{fem} + \\ & \beta_6 \times \ln(\text{hours}) + \beta_7 \times \text{party} + \beta_8 \times \text{ethnic} + \beta_9 \times \text{o2collect} + \beta_{10} \times \text{o3private} + \\ & \beta_{11} \times \text{o4foreign} + \beta_{12} \times \text{n2long} + \beta_{13} \times \text{n3shor} + \beta_{14} \times \text{n4other} + \beta_{15} \times \text{s4cons} + \\ & \beta_{16} \times \text{s5tran} + \beta_{17} \times \text{s6comm} + \beta_{18} \times \text{s7real} + \beta_{19} \times \text{s8heal} + \beta_{20} \times \text{s9educ} + \\ & \beta_{21} \times \text{s10scie} + \beta_{22} \times \text{s11fina} + \beta_{23} \times \text{s12gove} + \beta_{24} \times \text{s13other} + \beta_{25} \times \text{central} \\ & \beta_{26} \times \text{west} + u \end{aligned}$$

For the pooled sample of males and females, the adjusted R-square in this extended model rises to 0.2778, compared with 0.1736 for the above basic model. Most independent variables are significant at the 5% level (See Table 6). Similarly, I estimate the same equation after dividing the whole data set into male and female samples. These

¹⁹ The variable definitions can be found in Table 1. Similarly, I drop the variable “fem” from this model for male or female sample.

results are shown on Table 6.

Furthermore, I repeat regressions for different groups divided by age, region, and workplace ownership²⁰. All returns to education for these groups are shown on Table 7.

5. Regression analyses

5.1. Analyses of overall returns to human capital from the basic model

Table 5 shows that the overall rate of return to education for the pooled sample in the basic model is 4.7%. Returns to education for women are estimated at 5.4%, which is higher than 4.1% for men. The effects of each additional year of work experience are 2.11% for all, 1.89% for male and 2.59% for female²¹. The negative coefficients on work experience squared show that the wage-experience profile follows a parabolic shape, which is consistent with the results from other market economies.

However, the returns to education using either estimated work experience or reported work experience in the regressions are still considerably lower than the estimated 10.1% world average and the 9.6% Asian average with similar kinds of empirical models (Psacharopoulos, 1994). This does not conform to the literature on education returns: usually higher rates of return to education are found in less-developed countries, and lower rates of return to education are found in more-developed countries For example,

²⁰ In these regressions, I used another model which is based on the first basic model by adding only two dummy variables related to individual background to it: "party" and "ethnic". All groups are categorized in the same way as done in the analyses of the mean earnings, except for the categorization of the educational level.

²¹ The effects of work experience are non-linear. These results are calculated as the following: $\partial \ln(\text{earn}) / \partial \text{exp} = b_2 + 2 * b_3 * \text{the mean value of the variable "exp"}$, where b_2 represents the estimated coefficient for work experience and b_3 represents the estimated coefficient for work experience squared.

values of 13.4% and 12.4% of the coefficient for years of schooling were found in Sub-Saharan Africa and Latin America/Caribbean, compared to a value of only 6.8% of return on years of schooling for OECD countries (Psacharopoulos, 1994). To some extent, Cultural Revolution and the egalitarian regime in the socialist system can explain this ignorance of the value of education in China (Li, 2003). The gradual transition process in China's economic reform also leads to a slow change in revaluation of human capital.

In most previous studies, researchers used estimated work experience as the proxy for on-the job training, which is expected to yield an overestimate of the years of work experience variable²², and thus affect estimations of returns to education and experience. The results from my examinations are interesting: using estimated work experience leads to higher rates of return to education for all cases, but it does not have much effect on the rates of return to work experience itself.

A comparison of my results with those from Maurer-Fazio reveals an increase for the rates of returns to education during the period from 1988 to 1995: increases of 2.5% for males and 2.4% for females. Here I use the estimated or potential work experience in the regressions, which Maurer-Fazio used in her paper²³. It is clear that the current estimated returns to education in China are also higher than most other previous estimates²⁴. More specifically, Meng and Kidd (1997) reported a Mincer-type return to education of 2.46%

²² In particular, these well-known problems with the potential experience measure are due to women's intermittent labour force participation associated with child-birth and child rearing.

²³ The returns to education are 5.4% for males and 6.9% for females in the 1995 sample. They are 2.9% for males and 4.5% for females in the 1988 sample.

²⁴ Jamison and Van Der Gaag(1987) reported 4.5% rates of returns to education for males and 5.5% for females using 1985 data gathered in Hui county. I think that these results are not robust due to the limitation of the dataset.

in 1981 for state-owned enterprises, which were the large majority of the country's enterprises at that time. With data from CHIP-88 and comparable models, Johnson and Chow (1997) found a 4.02% rate in rural areas and 3.29% in the urban areas, and Liu (1998) provided estimates of returns to education ranging from 2.8% to 3.6% for the pooled sample. However, my estimates are a little bit lower than those reported by Li (2003), who used the same data as mine, due to some differences in model specification setup and data selection²⁵. This basically upward trend in the magnitude of estimates reveals that the returns to education have increased as the economic transition continues and demonstrates that the labour market has changed to a well-functioning one as the Chinese economy has moving to an increasingly market-oriented system.

5.2. Analyses of wage determination from the extended model

The results from the extended model describe more characteristics of the wage determination process in urban China²⁶ (Table 6), but in this model the levels of returns to human capital are lower than in the basic one. The returns to education in this model are 2.974% for the pooled sample, 2.683% for males and 3.314% for females and the effects of additional work experience on earnings are 1.7% for all individuals, 1.5% for men and 1.86% for women respectively.

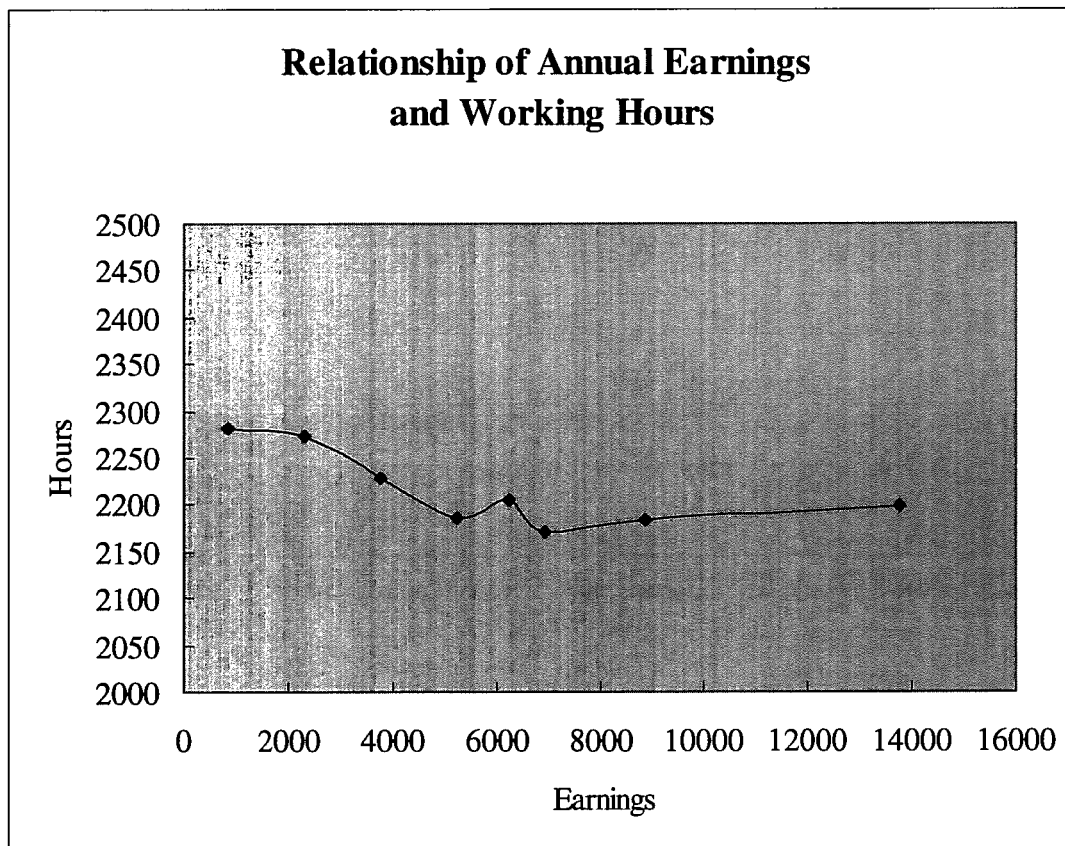
²⁵ I reported the rates of return to education are 4.7% for the pooled sample, 4.1% for males and 5.4% for females, and Li provided that estimations of 5.4% for all, 4.3% for males and 6.9% for females. There are two main differences between Li's model and mine: 1.Li used log of hourly wages as dependent variable and I use log of annual earnings as dependent variable and then add log of total working hours to the right side of equation to control for the time difference; 2.Li added provincial dummy variables to her model but I use regional dummy variables. There exist differences in data selection too, such as age ranging from 18 to 60 in Li's paper and from 16 to 60 in mine. The sample in my paper includes 11565 individuals with 6228.56 Yuan as the mean value of earnings in 1995 and the sample in Li's paper included 10913 individuals with 6132 Yuan as the mean value of earnings.

²⁶ The reported years of work experiences are used in all these regressions.

One interesting finding is that the variable “nonmar” is insignificant at even 10% level in female regressions but has the negative coefficient in the male sample, for both the basic model and the extended one. This shows that the marital status has no effects on the earnings for women in China. The negative effects on earnings for non-married men are consistent with those found for most other countries.

It is necessary to explain here the surprising result about the effect of working-hour variable. This variable is insignificant in the pooled regression at the 5% level and in the male and female sample even at 10% level, and furthermore it has a negative effect on earnings in all cases. Generally, a person working less would earn less in a well-functioning market economy. Why does one earn less when he works longer hours? In order to examine this phenomenon, I divide the 1995 sample into seven groups according to the level of annual earnings and show the descriptive statistics of the variables related to annual earnings and working hours in Table 8. Firstly I could simply consider that the working-hour variable has a small effect on earnings in China due to far less diversity in working hours for different individuals. From table 8, we can find that the standard deviation of average work hours per day is less than one hour, and the standard deviation of average work days per week is only about 0.5 days. Secondly, I have to impute this to income inequality in modern-day China by summarizing the relationship of annual working hours and annual earnings in Figure 3. One can find that people who earn less spent more time working on an annual basis in this sample, which to some extent may reveal dysfunction of the labour market in China.

Figure 3



Another interesting finding is that the wage premiums for communist party members are notably high from the 1995 sample: 10.6% for all workers, 10.1% for males, and 12.3% for females. But one cannot identify whether these premiums just come from the political privilege that they possess or from the average superior unobservable human capital characteristics of the party members. The wage differentials resulting from gender and minority status are as expected: the log wage for female is 11.2% less than males and that for national minority is 5.9% less than Han Chinese.

A series of coefficients of dummy variables related to workplace ownership reveals more results. Individuals working in collective enterprises earn about 21% less than those

working in state-owned enterprises, which is the reference group. However, people working in foreign enterprises, including sino-foreign joint ventures and foreign owned firms, earn about 49% (38% for men and 48% for women) more than people who work in public-owned enterprises, whether at central, provincial or local levels²⁷. In addition, permanent workers or employees of an enterprise or institution (including state cadres and civil servants) earn more than all other groups, including long-term or short-term contract employees and private or individual enterprise proprietors and so on²⁸. This is a little bit surprising since people with short-term and unstable jobs have greater risk on their employment and should earn higher incomes according to the theory of compensating differentials. These results may reveal the existence of inefficiency and inequality in the wage system and show a gradual process of transition toward a market-oriented wage system in China.

The coefficients of the economic sector dummy variables describe the wage premium for different sectors. All economic sectors in urban china except for commerce and trade obtain significantly more or less wage premium compared with their reference group: industry sector²⁹. People who work in the finance and insurance sector enjoy the highest wage premium, earning 33% more than workers in industry sector. Individuals in health service, education and scientific research sectors also earn on average about 10% more

²⁷ The dummy variable representing private or individual enterprises is insignificant here since the proportion of people who work in private or individual enterprises is very small in this sample.

²⁸ In general, permanent employees have labour contracts with a termless tenure; long-term employees have labour contracts with tenure above 5 years; short-term employees have labour contracts with tenure below 5 years.

²⁹ This sector includes businesses in the fields of restaurants and catering, material supply, marketing, and warehousing. In China, industry just represents manufacture.

than those workers in industry.

Regional effects on earnings are very significant, as could be expected. In the seventh Five-year plan of China, the mainland is divided into three main regions: the Coastal Region, the Western Region, and the Central Region. Of the three regions, the Coastal Region is by far the most important, because it contains the largest industrial cities, and all four of the Special Economic Zones (SEZ)³⁰. Remarkable negative effects on earnings of the dummy variables for west and central regions are shown here when I choose Coastal region as a reference group.

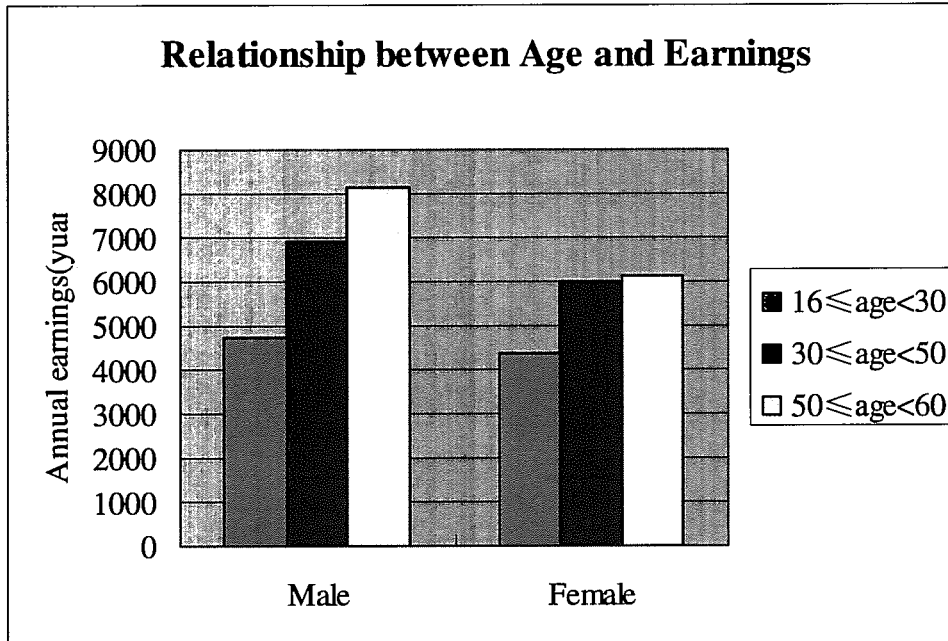
5.3. Age cohorts' analyses of returns to education

In order to investigate the effects of market forces on the wage determination process in China, it is necessary to study the performances of different age cohorts. These results are presented in Table 7. In particular, one should pay attention to the experience of young people who represent the new labour force entrants. From my results, while individuals under age 30 on average earn less than other age cohorts (Figure 4), they enjoy higher rates of return to education (5.527 % for all, 5.118% for male and 5.903% for female, in Table 7) than others except for those women over 50. The return to education for women with age over 50 is 9.69%, which is surprisingly high. This is partly due to female's employment age ranging from 16 to 55 by law, which leads to a large proportion of superior women staying at their positions and enjoying their high income in

³⁰ "Special Economic Zones (SEZ's) are development zones established by the PRC to encourage foreign investment in China, bringing much needed jobs, technical knowledge, and future tax revenues in return for significant tax concessions at start-up of the operations and over a number of years." This information comes from <http://chinaunique.com/business/sez.htm>.

this age range.

Figure 4



Although all of these rates of return for young employees are still low compared with other more developed Asian labour markets, such as the general estimated rates of return of 6.5% and 6.1% for Japan and Hong Kong respectively (Psacharopoulos, 1994), they still suggest that new labour force entrants enjoy higher returns to education than older ones. These current results are lower than those reported in Maurer-Fazio, which are 6.4% for males and 6.8% for females. I consider that this is because she used estimated work experience in the regression of earnings function and therefore overestimated the overall returns to education. If I include estimated work experience to my regression equations, the returns to education for people younger than 30 will rise to 9% on average.

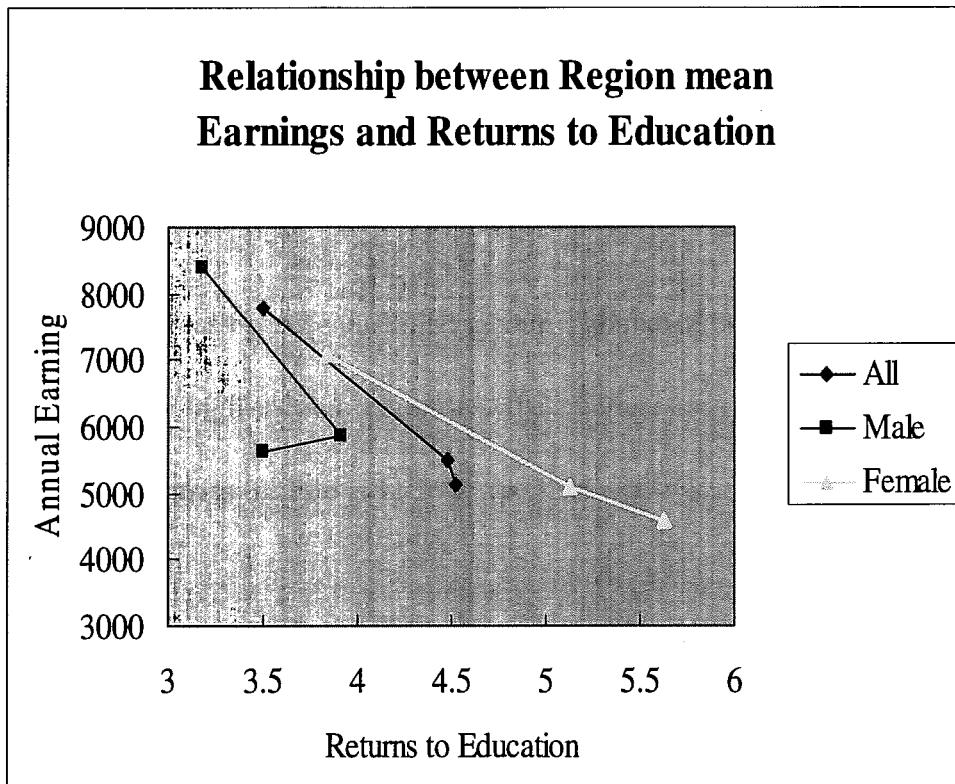
5.4. Regional analyses of returns to education

Maurer-Fazio expected that the returns to schooling in the developed coastal regions would be higher than those in the less developed interior regions, since the Eastern or Coastal Region has a more widespread and longer experience with a developed labour market. But her regression results obtained from dividing the whole sample into 4 regional sub-samples produced no clear pattern of evidence to support this hypothesis. However, my regression results provide a totally different picture, as shown in Figure 5. The mean annual earnings of the three regions are 7795 Yuan for the Eastern Region, 5491 Yuan for the Western Region and 5136 Yuan for the Central Region respectively (Table 4), showing that individual incomes in the rich Eastern Region are much higher than those in the other two regions. But the returns to education for the pooled regression are 3.5% for the Eastern region, 4.4% for the Western region, and 4.5% for the Central region (Table 7), indicating an inverse relationship. It is clear that the returns to education are significantly higher in the poor central and west areas than in developed east region. Usually, there is more internal inequality in poor regions than in rich regions, so higher returns to education are not surprising.

Li (2003) reached a similar conclusion in her paper when she investigated this hypothesis in two typical provinces in China: one of the most developed coastal provinces, Guangdong, and one of the poorest provinces in the country, Gansu. She estimated 4% returns to education in Guangdong and 6% in Gansu. I agree with her explanation about this phenomenon: "Generally, return to education is higher in

less-developed areas because unskilled labour is abundant but educated people are scarce. For example, in high-income countries, the average rate of return is 6.6%, while in low-income countries the rate is 11.2%". (p. 324)

Figure 5



5.4. Ownership analyses of returns to education

One would expect to see higher returns to education in the sectors which operate to a higher degree according to the market mechanism. In order to explore this hypothesis, a set of earnings function regressions are estimated, and I then focus on a comparison of state-owned sector including all central, provincial and local level enterprises or

institutions, collective sector including urban collective and township and village enterprises, and private sector including private, individual, sino-foreign joint venture and foreign owned enterprises. The returns to education for these three sectors are 3.8% for state-owned sector, 3.3% for collective sector, and 5.2% for private sector, respectively. These results reveal that the private sector enjoys significantly higher returns to education than the state-owned sector, which performs better than collective enterprises³¹. The comparison of the state-owned sector and the private sector really supports the notion that the more wages are market determined, the higher the rewards to schooling years, which was also shown by Maurer-Fazio in her study using the 1988 sample. It is not clear why the returns to education are lowest in collective enterprises, which have more flexibility and power in operation and administration than state-owned enterprises. I consider that nepotism and inefficiency in current collective enterprises explain in part these results. When comparing the returns to education in the state-owned sector over time, one could see that even in this sector, the returns to schooling are increasing. Based on comparable models they had changed from 2.5% in 1981 and 2.7% in 1987 (Meng and Kidd, 1997), to 2.6% for males and 3.5% for females in 1988 (Maurer-Fazio, 1999), and finally to 3.3% for men and 4.6% for women in 1995. This trend represents the future direction for the state-owned sector, as market-oriented reforms continue and take hold within it.

³¹ There is a preclusive example in all cases: for the male sample, the returns to education in collective sector are higher than state sector.

6. Conclusion

This paper has examined overall and gender-disaggregated returns to education and the wage determination process in Urban China using the data set from the Chinese Household Income Project 1995. The main methodology of this paper consists of the estimates of earnings functions based on the Mincerian model. The major findings of my study are as follows.

The rate or return to schooling years is fairly low in 1995 Urban China: 4.1% for males and 5.4% for females in basic model. In most cases the rates of return to education for females are higher than those for males. Although these results are low, on average, they are still slightly higher than those found in previous research, which shows that in post-reform China, the returns to education have increased albeit slowly. In addition, the effects of each additional year of work experience are relatively high, and wage-experience profile follows a parabolic shape. It is clear that the rates of return are not increasing in a significant way when I compared my results with those of Maurer-Fazio's³². I consider that this is because the work experience accumulated in previous non-market-oriented economy is to some extent obsolete in current market-oriented economy.

The study of the coefficients of some independent variables related to individual attributes exhibits some interesting characteristics of wage determination in urban China.

³² The rates of return to work experiences are 1.9% for male and 2.6% for female in my results; and they are 0.9% for males and 1.5% for female in Maurer-Fazio's paper.

The effects of marital status and total working hours are insignificant on earnings in most cases. The wage premiums for communist party members are remarkably high from the 1995 sample³³, suggesting that political capital is still an important determination of individual wages, even in post-reform China. Wage discrimination resulting from gender and minority status is as expected³⁴.

Furthermore, the coefficients of a series of dummy variables based on different explanatory factors show more characteristics in China's labour market. Individuals working in foreign enterprises earn the most in Urban China in 1995, while people employed in the collective enterprises earn the least in all types of enterprises³⁵. The earnings gap between these two sectors is wider in the female sample than in the male sample, which is close to 70% for the former and 58% for the latter. The short-term contract workers, the self-employed individuals and so on earn much less than the permanent and long-term employees³⁶. People who work in the industry sector earn less than most other economic sectors in urban China in 1995. Individuals working in the finance and insurance sector obtain the largest wage premiums, though the proportion of these employees is small relative to all individuals. The gaps among sectors are significant in China, with a difference of close to 40% in wages between the highest paying economic sector and the lowest paying one. Obviously, people living in the west

³³ They are 10.6% for all, 10.1 for males and 12.3% for females, respectively.

³⁴ A 11.2% decrease in log of earnings for female and a 5.9% decrease in log of wage for national ethnic minority are estimated for this sample.

³⁵ On average, employees in foreign firms earn about 44% more than those in state-owned institutions or enterprises, and workers in collective enterprises obtain 21% less income than people in the state-owned enterprises. Therefore, people in the foreign sector earn 63% more than those in the collective sector.

³⁶ Long-term workers earn about 4% less than permanent workers.

and central regions earn much less than people who live in the coastal region. These results conform with the regional disparities in per capita GDP. Based on 1993 data (Wei and Liu, 1994), the relative gap between the coastal and the central region is 46.9%, and the relative gap between coastal and western region is 54.6%³⁷.

Regression results from the different groups categorized by age cohorts, regional clusters, and ownership sectors reveal many features about returns to education in China. Firstly, young people, say under age 30, are rewarded significantly more for schooling years. To some extent, this indicates the future direction in the wage structure of China's labour market: the rates of returns to education will increase for new labour force entrants until they are in line with those other market economies. Secondly, it is clear that the returns to education are significant higher in poor central and west areas than in developed east area, since skilled workers are very scarce in those less-developed regions. Thirdly, the private sector awards higher returns to education than the state sector. I consider this is due to more autonomy for the selection of workers and the dismissal of them, and more flexibility for rewards to productive behavior in the private sector.

In conclusion, as economic reforms have advanced in China, the returns to education have increased in a stable way consistent with gradual economic transition. The more power yielded to market forces, the higher the returns to education one is likely to see in urban China. To some extent, this is a sign of the success of China's labour market reform. Although wage determination process in China shares some features with those in other

³⁷ Relative gap= (maximum-minimum)/ maximum * 100% in this calculation.

countries, there are still some particularities in the China's economy such as the effect of Community Party membership. Future research should address more characteristics and further changes in returns to education and wage determination.

Table 1
Definitions of Variables for the Earnings Equations

LN(EARN)	Natural logarithm of earnings	
SCHOOL	Total years of schooling	
EXP	Reported work experience	
EXP1	Estimated work experience(age-schooling-7)	
EXPSQ	Reported work experience squared	
EXP1SQ	Estimated work experience squared	
NONMAR*	Never married	
FEM*	Female	
LN(THOURS)	Natural logarithm of total working hours in 1995	
PARTY*	Member of communist party	
ETHNIC*	National ethnic minority	
FIRM OWNERSHIP AND RELATED DUMMY VARIABLES	owner	Ownership of the workplace
	o1public*	State-owned institution or enterprise (Reference group)
	o2collect*	Collectively owned enterprise
	o3private*	Private and individual enterprise and other
	o4foreign*	Sino-foreign joint venture or foreign owned enterprise
NATURE OF EMPLOYMENT AND RELATED DUMMY VARIABLES	nature	Nature of employment
	n1perm*	Permanent (Reference group)
	n2long*	Long-term
	n3short*	Temporary (including short-term contact)
	n4other*	Private enterprise proprietor or self-employed or other
SECTOR AND RELATED DUMMY VARIABLES	sector	Economic sector
	s2indu*	Industry (Reference group)
	s4cons*	Construction
	s5tran*	Transportation, communications, posts and telecommunications
	s6comm*	Commerce & trade, restaurants& catering, supply, marketing, and warehousing
	s7real*	Real estate, public utilities, personal and consulting services
	s8heal*	Health, physical culture and social welfare
	s9educ*	Education, culture, arts and broadcasting
	s10scie*	Scientific research and technical services
	s11fina*	Finance, insurance
	s12gove*	Government and Party organs, social organizations
s13other*	Agriculture, forestry, animal husbandry, fishing ,mining and other	
REGION AND RELATED DUMMY VARIABLES	reg	Regional division
	east*	Eastern or coastal region (Reference group)
	central*	Central region
	west*	Western region

Note: "*" means dummy variables----1 if criterion satisfied, 0 otherwise.

Table 2
The Relationship between Provinces and Regions in China

Provinces Region	Name and Code of province in the sample	Name of province in Mainland China
Eastern(Coastal)	Beijing(11), Liaoning(21), Jiangsu(32), Guangdong(44),	Beijing, Tianjing, Hebei, Liaoning, Shandong, Shanghai, Jiangsu, Zhejiang, Fujian, Guangdong, Guangxi, Hainan
Central	Shanxi(14), Anhui(34), Henan(41), Hubei(42)	Shanxi(山西), Neimenggu, Jiling, Heilongjiang, Anhui, Jiangxi, Henan, Hubei, Hunan
Western	Sichuan(51), Yunnan(53), Gansu(62)	Chongqing, Sichuan, Guizhou, Yunnan, Xizhang, Shanxi (陕西) , Gansu, Qinghai, Ningxia, Xinjiang

Source: 1. Chinese Household Income Project 1995.

2. The Seventh Five-Year Plan in China

Note: The numbers in the parenthesis of the second column are the codes of the corresponding provinces in the sample. The symbols in the parenthesis of the third column are the Chinese language of the corresponding provinces since those two different provinces have the same translation in English.

Table 3**Variable means: CHIP 1995 data for individuals in china urban area**

Variables	All	Males	Females
Background			
Age	38.34	39.51	37.05
%16≤age<30	19.07	17.44	20.89
%30≤age<50	68.64	65.33	72.32
%50≤age<60	12.29	17.23	6.79*
Years of schooling	10.80	11.09	10.47
Years of reported work experience	19.22	20.55	17.75
Years of estimated work experience	20.55	21.43	19.57
% Never married	11.66	12.28	10.98
%Communist Party members	25.01	33.70	15.34
%National ethnic minority	4.29	4.25	4.33
%Head of household	44.64	55.97	32.05
Income			
Monthly income (Yuan), from work unit of which:	6228.56	6737.45	5662.72
Annual subsidies (Yuan) from work unit	1245.81	1309.58	1173.65
Education			
%Below primary	0.36	0.20	0.55
%Primary	4.64	4.07	5.28
%Junior high	29.94	28.07	32.01
%Senior high and vocational high	41.46	39.09	44.10
%Vocational college	15.64	18.18	12.82
%University or above;	7.96	10.40	5.24
Region			
%Eastern(Coastal) region	37.42	37.74	37.07
%Central region	35.17	35.42	34.88
%Western region	27.41	26.84	28.05
Ownership of workplace			
%Working in state-owned institution or enterprise	82.03	86.16	77.42
%Working in collectively enterprise	15.26	11.33	19.64
% Working in Private and individual enterprise and other	1.41	1.20	1.64
% Working in Sino-foreign or foreign owned enterprise	1.31	1.31	1.30
Nature of Employment			
%Permanent employee	76.49	78.96	73.75
%Long-term employee	19.35	17.71	21.19
%Temporary (including short-term contact) employee	2.65	1.90	3.48
%Private enterprise proprietor or self-employed or other	1.51	1.44	1.58

Table 3
Continued

Variables	All	Males	Females
Economic Sector			
%Industry	41.74	42.94	40.41
%Construction	2.88	3.24	2.48
%Transportation, communications, posts etc.	5.12	5.94	4.21
%Commerce and trade etc.	14.54	12.28	17.04
%Real estate, public utilities, personal and consulting services	3.74	3.29	4.23
%Health, physical culture and social welfare	4.60	3.56	5.76
%Education, culture, arts and broadcasting	7.38	6.26	8.62
%Scientific research and technical services	2.43	2.66	2.16
%Finance, insurance	2.02	1.87	2.20
%Government and Party organs, social organizations	12.02	13.96	9.88
%Agriculture, forestry, animal husbandry, fishing or water conservancy, Mining and geological survey and other	3.53	4.01	3.01

Source: Chinese Household Income Project 1995.

Note: 1. This sample includes workers age 16-60 with wage in 1995 , It excludes full-time student and full-time homemaker , retired workers and workers who were disabled, injured or had chronic disease.

2. At “*”, the proportion of women with age range from 50-60 is significantly less than men since employment age is from 16 to 55 for women but from 16 to 60 for men.

Table 4**Mean annual earnings: CHIP 1995 data for individuals in china urban area**

Group	All	Male Wage(Yuan)	Female Wage(Yuan)
All groups	6228.56	6737.45	5662.72
By education			
Below primary	4137.55	4390.00	4036.57
Primary	5336.58	6047.79	4726.27
Junior high	5617.84	6270.21	4981.84
Senior high and vocational high	6112.20	6492.96	5736.96
Vocational college	7130.51	7306.31	6853.28
University or above;	7975.86	8238.01	7397.66
By age			
16≤age<30	4530.02	4708.05	4364.75
30≤age<50	6453.70	6912.38	5992.94
50≤age<60	7607.76	8128.61	6139.02
By region			
Eastern(Coastal)	7794.65	8393.00	7117.31
Central	5136.11	5628.68	4579.83
Western	5491.97	5872.79	5086.86
By ownership			
State-owned	6467.27	6888.14	5945.11
Collectively owned	4828.35	5391.72	4466.11
Other (Private or foreign owned)	6981.97	7621.65	6370.64

Source: Chinese Household Income Project 1995. This sample includes workers age 16-60 with wage in 1995. It excludes full-time student and full-time homemaker, retired workers and workers who are disabled, injured or had chronic disease.

Table 5
Regression Estimation of the Basic Form of Earnings Function

Variables	All		Male		Female	
	estimates	t-statistic	estimates	t-statistic	estimates	t-statistic
Model involving reported work experience:						
Intercept	7.92303	38.51	8.00836	30.12	7.71424	24.23
school	0.04698	24.25	0.04081	16.33	0.05427	17.96
exp	0.05313	19.22	0.04188	11.35	0.07184	15.84
expsq	-0.00083	-12.9	-0.00056	-6.99	-0.00134	-11.59
nonmar	-0.03886	-1.61***	-0.10521	-3.23	0.04499	1.22***
fem	-0.12955	-11.35				
lnhours	-0.05763	-2.21*	-0.04651	-1.38	-0.07547	-1.86**
Adjusted R-square	0.1736		0.1569		0.1567	
F-statistic	400.16		224.63		201.29	
No. Observation	11399		6008		5391	
Model involving estimated work experience:						
Intercept	7.791	37.21	7.83383	29.20	7.61838	23.53
school	0.06181	28.93	0.05432	20.18	0.06953	20.44
exp1	0.05097	19.12	0.03750	10.47	0.07526	18.05
exp1sq	-0.00079	-13.84	-0.00044658	-6.17	-0.00145	-15.31
nonmar	-0.05526	-2.18*	-0.12031	-3.64	0.06127	1.56***
fem	-0.14168	-12.34				
lnhours	-0.05907	-2.24*	-0.04087	-1.21***	-0.0884	-2.15*
Adjusted R-square	0.1589		0.1538		0.1426	
F-statistic	360.65		219.77		180.70	
No. Observation	11424		6020		5404	

Source: Chinese Household Income Project 1995.

Note: 1. The dependent variable for the two regression models is the natural log of annual earnings, which includes all reported wages, bonuses, subsidies and income in kind.

2. “*” means $0.01 < p\text{-value} \leq 0.05$; “***” means $0.05 < p\text{-value} \leq 0.1$; “****” means $p\text{-value} > 0.1$.

3. If add the dummy variable “party” and “ethnic” to this model (involving reported work experience), then the coefficients of schooling years are 4.331% for all, 3.694% for males and 5.04% for males (with adjusted R-square 0.1784, 0.162 and 0.1617 respectively).

Table 6
Regression Estimation of the Extended Form of Earnings Function

Variables	All		Male		Female	
	estimates	t-statistic	estimates	t-statistic	estimates	t-statistic
Intercept	8.34071	42.94	8.41596	33.31	8.13717	27.22
school	0.02974	15.02	0.02683	10.43	0.03314	10.82
exp	0.04655	17.68	0.03583	10.18	0.0665	15.39
expsq	-0.00078	-12.89	-0.00051	-6.74	-0.00135	-12.33
nonmar	-0.10628	-4.64	-0.15781	-5.07	-0.03778	-1.09***
fem	-0.11192	-10.25				
lnhours	-0.04696	-1.91**	-0.04188	-1.31***	-0.05819	-1.53***
party	0.10595	7.89	0.10092	6.22	0.12344	5.31
ethnic	-0.05857	-2.27*	-0.04422	-1.29***	-0.07229	-1.87**
o2collect	-0.21463	-13.81	-0.20893	-9.14	-0.21251	-9.92
o3private	0.03371	0.63***	-0.05747	-0.7***	0.08201	1.14
o4foreign	0.44389	9.2	0.38466	5.89	0.47913	6.69
n2long	-0.04397	-3.08	-0.03991	-2.05*	-0.04504	-2.15*
n3short	-0.09201	-2.6	-0.05088	-0.94***	-0.09014	-1.9**
n4other	-0.38805	-7.58	-0.17545	-2.33*	-0.53533	-7.52
s4cons	-0.01605	-0.5***	0.02122	0.53***	-0.0701	-1.35***
s5tran	0.09719	3.94	0.07987	2.62	0.12222	3
s6comm	-0.0527	-3.29	-0.04984	-2.21*	-0.0547	-2.39**
s7real	0.01953	0.68***	0.1057	2.63	-0.05276	-1.29***
s8heal	0.14612	5.57	0.0839	2.16*	0.19906	5.54
s9educ	0.10265	4.7	0.08387	2.71	0.13503	4.35
s10scie	0.12532	3.56	0.14682	3.29	0.11175	2**
s11fina	0.33165	8.7	0.27825	5.32	0.3878	7
s12gove	0.04625	2.54	0.02934	1.28***	0.07981	2.71
s13other	-0.01444	-0.49***	0.00155	0.04***	-0.02282	-0.48***
central	-0.37589	-30.34	-0.35461	-21.68	-0.39461	-21.04
west	-0.30601	-23.09	-0.31309	-17.77	-0.29415	-14.79
Adjusted R-square	0.2778		0.2548		0.2745	
F-statistic	169.60		83.17		82.56	
No. Observation	11340		6008		5391	

Source: Chinese Household Income Project 1995.

Note: 1. This model involves the variable "reported work experience".

2. The dependent variable for the two regression models is the natural log of annual earnings, which includes all reported wages, bonuses, subsidies and income in kind.

3. "*" means $0.01 < p\text{-value} \leq 0.05$; "***" means $0.05 < p\text{-value} \leq 0.1$; "****" means $p\text{-value} > 0.1$.

Table 7**Rate of Return for Schooling (Using Reported work experience in the estimated equation)**

Group	All		Male		Female	
	Return%	No.	Return%	No.	Return%	No.
All groups	4.331%	11399	3.694%	6008	5.04%	5391
By age						
16≤age<30	5.527	2169	5.118	1042	5.903	1127
30≤age<50	3.836	7829	3.450	3930	4.139	3899
50≤age<60	4.855	1401	3.347	1036	9.690	365
By region						
East	3.503	4266	3.181	2266	3.84	2000
Central	4.523	4012	3.498	2129	5.629	1883
West	4.483	3121	3.918	1613	5.127	1508
By ownership						
State-owned	3.827	9212	3.265	5106	4.645	4106
Collectively owned	3.283	1705	3.853	667	2.661	1038
Other(Private or foreign owned)	5.196	301	5.01	145	5.004	156

Source: Chinese Household Income Project 1995.

Note: 1. Returns are the coefficients on years of schooling in extended earnings functions multiplied by 100.

2. No. denotes the number of observations in each sub sample.

3. The returns to education in this table are from the model including independent variables: "school", "exp", "expsq", "nonmar", "fem", "lnthours", "party" and "ethnic".

Table 8**Descriptive Statistics of the variables related to annual earnings and working hours**

All individuals			
Variable	Number	Mean	Standard Deviation
day	11565	5.4588846	0.6385855
hour	11565	7.751751	0.993157
hours	11565	42.3953307	7.9654246
tohours	11565	2204.56	414.2020799
earning	11565	6228.56	3767.87
individuals with annual earnings below 1500 Yuan			
earning	404	858.8564356	429.7453735
tohours	404	2282.08	556.6127563
individuals with annual earnings from 1500 Yuan to 3000 Yuan			
earning	1216	2324.51	425.130992
tohours	1216	2272.95	492.3084956
individuals with annual earnings from 3000 Yuan to 4500 Yuan			
earning	2231	3789.04	424.7112791
tohours	2231	2229.36	411.6231298
individuals with annual earnings from 4500 Yuan to 6000 Yuan			
earning	2637	5228.84	430.5284471
tohours	2637	2186.25	389.4052047
individuals with annual earnings from 6000 Yuan to 8000 Yuan			
earning	2512	6926.53	584.0580977
tohours	2512	2170.19	389.7018777
individuals with annual earnings 8000 Yuan to 10000 Yuan			
earning	1246	8884.28	565.4858355
tohours	1246	2183.25	356.4841084
individuals with annual earnings above 10000 Yuan			
earning	1319	13759.46	4835.65
tohours	1319	2198	420.9599803
note: variable 'day'---average work days per week; variable 'hour'---average work hours per day; variable 'hour'---average work hours per week; variable 'tohours'---total work hours in 1995; tohours=hours*52; variable 'earning'---annual individual earnings, in Yuan.			

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