

Privatization, Retirement Policy, and Labor Market Gender Gaps in Urban China, 1990-2005

Christina Jenq *

November 30, 2015

JOB MARKET PAPER

Abstract

The employment gender gap in urban China significantly increased, particularly among the older and less-educated, during the restructuring of state-owned enterprises that occurred in the 1990's and 2000's. I describe two versions of a theory of "Ownership-Specific Human Capital (OSHC)" that can explain these results. In one version, firms are reluctant to hire those who have less private sector-specific skills. In another version, privatized firms, who are interested in investing in the skills of their employees, favor workers with a longer future work life. To address competing explanations, I establish a strong causal link between privatization and the increasing employment gender gap by developing a novel proxy for two parameters of privatization. I find that female industry-biased privatization can explain almost 50% of the increase in the employment gender gap and that, consistent with OSHC predictions, female industry-biased privatization more negatively affected the employment of older and less-educated females, while also negatively affecting older female wages. I then analyze re-employment rates in 1996-2001 to distinguish between the two OSHC theories. In support of the latter version, I find that the gender gap in re-employment rates disappears after adding measures for predicted years until retirement. Retirement age predictions were based on China's retirement policy of females, particularly less-educated females, having lower retirement ages relative to males. Other competing explanations for the increase in the gender employment gap cannot satisfactorily explain these results. I conclude that China's retirement policy has significantly contributed to the increase in the employment gender gap in the 1990-2005 period.

Key words: Gender Gap, Privatization, China, Transition Economies

JEL classifications: J21, J24, J26

*I wish to thank Albert Park, Hoyt Bleakley, Junjian Yi, and the Social Sciences seminar at HKUST for helpful suggestions. I am grateful for data provided by Junjian Yi. This research was assisted by support from the Institute for Emerging Market Studies (IEMS) and Institute for Advanced Study (IAS) at Hong Kong University of Science and Technology. Correspondence: Institute for Emerging Market Studies (IEMS) at Hong Kong University of Science and Technology. email: cjenq@ust.hk

1 Introduction

Deng Xiaoping's 1992 "Southern Tour" marked the beginning of a massive restructuring of the state-owned enterprise (SOE) sector. In 1997, as SOEs became increasingly profitable, a large-scale reform of urban state-owned enterprises was announced called "Hold On to the Large, Let Go of the Small (抓大放小)". This reform initiative included a broad range of restructuring activities, including the shut down of unprofitable enterprises, the conversion of SOE's into private corporate structures, mergers, and the birth of new private enterprises¹. The reforms quickly expanded nationwide. According to a recent study, 80% of the enterprises found in 1998 were privatized by 2007 (Hsieh and Song, 2015). Meanwhile, Figure 4 shows the sharp decline in the share of collective and state-owned urban employment beginning around 1997, when the urban enterprise reforms spread across China.

While statistics vary according to data source, the negative impact of privatization on employment was significant. Over 25 million workers were officially laid off from 1998 to 2002 according to Giles et al. (2005). Public employment (state and collective employment) fell from 76% in 1995 to 33.4% in 2002.

Meanwhile, employment gaps opened up. Using a six-province sample of China's Urban Household Survey, Figure 1 shows that urban female employment declined relative to male employment. Figures 2 and 3 show that the increase in the gender employment gap was concentrated among the older and less-educated.

Existing literature has focused primarily on analyzing the increasing gender wage gaps in urban China, or analyzing the factors behind gender differences in unemployment durations. While some have presented suggestive evidence of discrimination and social networks being a factor in the female gap in unemployment durations, none have been able to systematically explain why unemployment was concentrated among the older and less-educated females.

This paper describes two versions of a theory of "Ownership-Specific Human Capital (OSHC)" that can explain these results, and presents empirical evidence in support of one particular version of that theory. I also show other potential explanations commonly used to explain the growing urban employment gender gap cannot explain these results.

The two versions of the theory of "Ownership-Specific Human Capital (OSHC)", similar in spirit to the concept of "Industry-Specific Human Capital", deliver very similar, but slightly different, empirical predictions.

In the first version, which I call the "Accumulated Capital" formulation, younger workers have relatively more private sector-specific skills while older workers have relatively more state sector-specific skills due to differences in relative tenures in these sectors, along with

¹Hereafter, I refer to these activities as "privatization".

differences in type of education. In addition, it assumes less-educated workers have relatively more state sector-specific skills while more-educated workers have a more general skill set applicable to the private sector. Privatizing firms demand more private sector-specific skills and thus lay off older and less-educated workers while hiring younger and more-educated workers.

In the second version, which I call the "Investment Returns" formulation, firms in the privatizing environment care about developing skills in the labor force that are not already present, as the centrally planned, inefficient state sector previously did not care about developing these skills. I describe a simple investment game in which skills are developed through an initial period of investment made with a convex cost function, and the returns to investment (productivity gains) are collected in future periods. It delivers the prediction that firms prefer workers with a longer projected work life at the firm, as they collect more revenue per worker.

There are several other mechanisms that could explain the increase in the gender employment gap during this privatization period, some of which are orthogonal to the privatization process, and none of which give specific predictions about why the less-educated and older would be more adversely affected by privatization. Some have pointed to systematic discrimination against females² that are correlated with the privatization process. Pre-existing differences in female labor supply or shifts in female labor supply either correlated or uncorrelated with privatization would result in lower female hazard rates out of non-employment. Within-industry technological change and cross-industry shifts unrelated to privatization, perhaps due to greater exposure to international export markets, could also be behind the growing employment gender gap. Lastly, I introduce the possibility that female-biased privatization is a major factor to consider, as female-heavy industries tended to be privatized to a greater extent.

To address explanations unrelated to privatization, I analyze the causal impact of proxies for two parameters of privatization on changes in employment outcomes from 1990-2000 and 1990-2005. One parameter corresponds to the gender-neutral magnitude of privatization, and the other parameter corresponds to the gender composition of privatization. Following methods used in regional economics to develop share-shift instruments for employment changes, I exploit regional variation in industry composition and cross-industry variation in privatization experience to calculate plausibly exogenous proxies for both the magnitude and sex ratio of privatization.

The reduced form results establish the causal link between female-biased privatization and the increase in the employment gender gap. Moreover, the gender composition of pri-

²unrelated to beliefs about relative productivity)

vativation estimate establishes the importance of female-biased privatization in the increase in the gender employment gap. Furthermore, the magnitude of this estimate is substantial; my preferred estimate suggests that female-biased privatization can explain almost 50% of the increase in the employment gender gap, suggesting that explanations unrelated to privatization are not primary in importance.

The results also show that that this female-biased privatization affected older and less-educated females more, consistent with the predictions of the two formulations of the Ownership-Specific Human Capital theory. Additional analysis for the 1990-2005 period using the 2005 Mini-Census are consistent with the 1990-2000 results. Moreover, also consistent with the OSHC formulations, analysis on the impact of privatization on wages in 1990-2005, while difficult to interpret given the changing composition of the labor force, suggests that older female wages were negatively affected by female-biased privatization.

I then analyze 1996-2001 employment history data from a detailed labor force survey of five major Chinese cities to further distinguish between the two formulations of the Ownership-Specific Human Capital Theory. I find that the gender gap in re-employment rates in the 1996-2001 period can be entirely explained by the gender differences in years until retirement, particularly for those within about 6 years before the official retirement age. This is because of China's gender-differentiated retirement policies, in which males retired at age 60, while highly educated females were forced to retire at age 55, and less-educated females were forced to retire at age 50. The results show that, to the extent that females in China, particularly less-educated females, had lower official retirement ages than males, firms were more reluctant to hire older and less-educated workers who were close to their retirement ages.

This last result is not only strong evidence for the "Investment Returns" description of Ownership-Specific Human Capital, it is also strong evidence against the validity of other explanations. If gender differences in labor supply were a major reason, whether through the roll-back of childcare programs or responses to changes in spousal income, or if discrimination were occurring, the gender gap in re-employment rates would remain. This result is also consistent with other related literature finding little evidence of state-sector discrimination against women in the process of layoffs, or that females had different labor supply preferences than males. This is also evidence against other ad-hoc explanations that attempt to explain the increase in the employment gender gap, such as shifts in industry labor demand or shifts in cross-industry growth unrelated to privatization.

This is the first paper to establish the causal effect of privatization, particularly female-biased privatization, on the increase in the employment gender gap. It is also the first to recognize the role of existing gender differences in retirement policy in the increase of

the employment gender gap overall, particularly among the older and less-educated. This paper also contributes to a greater understanding of how the restructuring of institutions in transition market economies have affected subpopulations differently in the labor market.

Section 2 reviews related literature. Section 3 provides a brief description of the enterprise restructuring behind the privatization process. Then Section 4 describes the various explanations that could have increased the employment gender gap, including a description of a theory of "Ownership-Specific Human Capital." Section 5 describes the empirical strategy to test the different explanations, presents specific empirical predictions for each of the mechanisms, and describes the data. Section 6 reviews the empirical results, and Section 7 discusses and interprets the results, and concludes with a brief discussion of welfare and policy implications.

2 Related Literature

While no papers have studied in depth the gender gap in urban employment in China, many have studied the issue of the earnings gender gap in urban China. Using various regression and decomposition methods, these studies document a growing "unobserved" component of the gender earnings gap that cannot be explained by observable characteristics. These unobserved characteristics have been given different interpretations, such as changes in relative distributions of unobserved skills, changes in the prices of unobserved skills, and discrimination.

Gustafsson and Li (2000), Shu and Bian (2003), and Millimet and Wang (2006) analyze the gender earnings gap in 1988 and 1995. There is no clear consensus about the mechanisms in these studies, and none directly analyze the evolution of gender differences in labor supply.

Zhang et al. (2007) analyze the Urban Household Survey from 1988-2004 and find that the earnings gap widened much more at the lower end of the earnings distribution.

Several studies analyzing growing male and total wage inequality in the 1990s period show a link between the timing of urban enterprise reforms and growing wage inequality. Whalley and Xing (2010) find that changes in the share of state-owned enterprises between 1995 and 2002 are a significant predictor of changes in the skill premium. Meng (2012) discusses how growing male wage inequality is concurrent with the timing of the privatization of the labor market, and find that adding ownership type and occupation information improves the explanatory power of the earnings specification.

Another group of studies has analyzed unemployment durations of displaced workers in China during the period of enterprise restructuring for detect evidence of gender discrimination. The evidence is mixed.

Appleton et al. (2002) was the first to note that women were disproportionately being laid off and had a lower likelihood of finding re-employment. Zhang and Dong (2008), using firm-level data to estimate relative productivities of men and women find women in domestic private firms experienced a apparent wage discrimination, as their marginal productivities were higher than their relative wages. Knight and Li (2006) find that earnings were significantly higher for re-employed male workers relative to female workers after controlling for observable characteristics. Meanwhile, they find that state- and collective-sector firms subsidized females, as their marginal productivities were lower than their relative wages.

Du and Dong (2009) analyze unemployment durations and find the probability of leaving non-employment for women is only 50% of the probability for men even after controlling for a rich set of controls. They also present suggestive evidence of women facing lower wages in the private sector, as they find that the elasticity of unemployment duration with respect to pre-displacement wages is significantly higher for women than men, which contrasts with the finding of gender similarity in responses to non-earned income sources. They interpret this finding as evidence that women face lower wages in the private sector.

Giles et al. (2006b) estimate a discrete duration model using data from the China Urban Labor Survey (CULS) to study the re-employment rates of urban workers, with a particular interest in the effect of social network access on unemployment durations. Among many results, they find that neither the presence of young children nor elderly in the household affects male or female re-employment rates in a statistically significant manner. In fact, they find that female labor supply is *increased* for those with children aged 18-22 years, presumably to help pay for college tuition. Liu et al. (2010), analysing married female labor supply in the China Health and Nutrition Survey, find that the presence of young children has no statistically significant effect on the employment status of women.

Meanwhile, Li and Dong (2011) points to gender differences in productivity and firm-specific effects to explain wage differences between males and females. They analyze the wage structure from a sample of employer-employee matched data of firms under the jurisdiction of the Nanjing municipality from 1994 to 2001 and find that wage setting at the firm level plays a much larger role in determining the gender earnings inequality than individual observable characteristics. They find that the earnings gap is highest in firms facing the most perceived product market competition and firms who tend to pay based on piece rate, suggesting lower female productivity as a reason behind the earnings gap.

This paper contributes to literature studying the evolution of labor market gender gaps in transition economies.

A series of papers studies the labor market impacts of Russia's transition. Brainerd (1998) found that wage inequality increased as returns to education increased, and that

female wages declined relative to male wages. They also find that relative wages of older workers have also declined. Brainerd (2002) studies the impact on wages after more time has passed, and finds that wages in private firms are higher than state firms. Glinskaya and Mroz (2000) find attribute the increasing gender wage gap to women being over-represented in low wage labor, and that most of the increase in gender wage inequality cannot be explained by observable characteristics. Ogloblin (1999), similar to Glinskaya and Mroz (2000), find that the gender earnings differential is due to segregation into occupations and industries by gender.

Another set of papers looks at other transition economies. Brainerd (2000) finds an increase in female relative wages in Eastern Europe but a decrease in Russia and Ukraine, as women were overrepresented in lower wage sectors. Hunt (1997) finds that the gender wage gap decreased in the transition of Eastern Germany, and that it was due to attrition in and out of the labor force by lower wage women.

This paper also related to the literature on industry-specific human capital. Industry-specific human capital (ISHC) is a type of human capital that a worker accumulates that is more productive when a worker stays in some industry rather than in another industry. Neal (1995) first introduced the concept to the literature after showing that displaced workers in the American labor market suffered large wage losses from switching industries, but not firms within industries. This paper also showed that the probability of switching industries upon displacement is decreasing in pre-displacement tenure and experience. In a more related empirical context, Han and Suen (2011) analyze the implications of industry-specific human capital in the context of industrial upgrading in Hong Kong and find that an increase in employment share of a particular industry is associated with a decline in the average age of its workforce. They note that older workers are less likely to leave declining industries, and that this effect is more pronounced among the less educated and females.

Lastly, the concept of an ownership-specific human capital was first introduced in Brainerd (1998), which analyzed changes in the wage structure of Russia's labor markets during its transition to a market economy. Brainerd hypothesized that, in the Russian context, the observation of a compression of experience differentials likely reflects a relative demand shift against older cohorts. Specifically, the human capital embodied in the most experienced workers reflects skills acquired under the "old" socialist system, while the transitioning economy rewarded skills from the new market-oriented system. Brainerd (1998), in her study of the labor market transition in Russia, gives examples of skills particularly useful in the state sector. She notes that Soviet managers were highly skilled in supply procurement, negotiating government subsidies, and maximizing output, and that this experience is unlikely to be rewarded in an environment in which the most sought-after managers were trained in

management, finance, and marketing, which were more likely to be embodied in the younger cohorts.

3 Background of China's Urban State-Owned Enterprise Restructuring

This section describes the economic and political context surrounding the enterprise restructuring (hereafter referred to as a process of privatization) that occurred began in the early to mid 1990's and ended in the early 2000's.

During Mao's rule in Communist China from 1949 until about the late 1970's, female labor force participation significantly increased, as gender equality in terms of equal pay for equal work was heavily stressed. By 1978, rates of urban employment among males and females were equal. As employees in the public sector, women were given access to social services and benefits like maternity leave, childcare, healthcare, and retirement pensions.

Under Mao, government departments and state-owned enterprises (SOEs) protected urban workers, as they provided lifetime employment, housing, health care and pensions to a majority of urban workers. These commitments lasted through the beginning of economic reforms in 1978 through the 1990's. Women were over-represented in the collective sector relative to the state-owned sector. It is noted that relative to state-owned enterprises, collectives offered lower wages and fewer benefits.

Unlike the experience of Central and Eastern European economies that underwent drastic "big bang" reforms, China's reform experience was much more gradual. For the roughly first 15 years after China's opening up in 1978, reforms were focused on restructuring the incentives of managers and workers. Township and village enterprises, small businesses, self-employment, and joint ventures emerged. Meanwhile, state employment and women's employment share increased. Women's share in formal employment increased from 33% to 39.4% during this period. The absolute number of employed women increased in every industry except agriculture, and the employment growth was faster for women in every industry except for construction.

The emergence of these new types of enterprises exerted a great amount of pressure on the more inefficient state-owned enterprises. SOE losses grew too unmanageably large as the government's full employment goals and firm's soft budget constraints increased state payrolls through the early 1990's. Some empirical studies estimate that 20-40% of state firm workers became redundant as of the early 1990's.

Deng Xiaoping's 1992 Southern Tour kicked off a policy of privatizing small and medium

SOEs while protecting larger enterprises in a few areas in China. Then in 1997, newly elected Premier Zhu Rongji, in an attempt to reverse the money-losing trends of the SOEs within a three-year period, ended lifetime employment of public sector employees and announced a large-scale reform of urban enterprises that in practice began a large-scale labor retrenchment program. This program was called "Hold On to The Large, Let Go of the Small" (*zhuada fangxiao*).

The reforms expanded nationwide quickly and drastically, likely due to strong incentives for local governments to sell off enterprises as quickly as possible in the wake of managers who were motivated to strip assets from the enterprises in order to buy the enterprises for a lower price. 1995 began an enormous wave of enterprises restructuring that saw firms corporatizing, merging, or shutting down in the state and collective sector. The number of state-owned firms fell from 118,000 in 1995 to 53,489 in 2001. In their analysis of the privatization process of enterprises in Jiangsu and Shandong, Ho et al. (2003) note the speed and homogeneity of this reform process across the different counties they studied. By late 1997, these reforms spread to the rest of urban China.

Giles et al. (2006a) note that the reform process consisted of a broad range of restructuring activities, including the shut down of unprofitable enterprises, diversifying ownership, shifting enterprises to modern forms of corporate governance, and de-linking the provision of social services from individual employers by privatizing housing and shifting responsibility for health insurance and pension provisions to a city or provincial government. Li and Dong (2011) describes how a large number of SOEs were transformed into joint-stock companies, declared bankrupt, merged with other enterprises, or sold to private individuals, typically existing managers. Meanwhile, a majority of township and village enterprises (TVEs) transformed their ownership rights from local governments to private investors in the late 1990's.

Accompanying these ownership restructuring changes were a series of steps undertaken to remove lifetime employment from workers. In 1994, a Labour Law was passed which sanctioned employers to dismiss workers. In 1996, a system of "labour contracts for all employees" was introduced to eliminate the distinction between permanent and temporary employees.

Hsieh and Song (2015) document that the share of state-owned firms in industrial output declined from 50 percent in 1998 to 30 percent by 2005. They find that small state-owned firms were closed or privatized after 1998, and these firms usually had lower labor and capital productivity. Meanwhile, new state-owned firms were established after 1998, typically large, and with labor productivity similar to that of the average private firm but significantly lower capital productivity.

While statistics vary according to data source, the negative impact on employment was

significant. Over 25 million workers were officially laid off from 1998 to 2002 according to Giles et al. (2005). Public employment (state and collective employment) fell from 76% to in 1995 to 33.4% in 2002. State employment decreased 37-40% while urban collective employment fell by nearly 60% Giles et al. (2006a). Du and Dong (2009) note that the collective sector, which had been cut off from state subsidies long before the SOEs, had been shedding jobs earlier than the SOEs. While employment in the "other" sector increased, public sector downsizing resulted in a net reduction of 43.5 million in urban formal employment.

Unemployment increased. Giles et al. (2006b) note that in the household survey data they collect, most job separations between 1996 and 2001 were involuntary. Indeed, Giles et al. (2006a) analyze the China Urban Labor Survey (CULS) from 2001 and find that during the 1996-2001 period unemployment reached double figures in all five sample cities and labor force participation declined by 8.9 percentage points. 40 million workers were registered as temporarily displaced, "*xiagang*", of which 34 million were from the state sector. They also noted that many people were often offered "early retirement", which can be considered another form of involuntary job separation.

Several studies also note that women experienced significantly higher unemployment rates (Appleton et al., 2002; Giles et al., 2006b; Du et al., 2006). Du et al. (2006), analyzing two nationally representative surveys, find that absolute unemployment rates were higher for women than for men in 2000, and that these rates grew faster for women relative to men between 2000 and 2003.

There was also a systematic roll-back of firm-provided social welfare benefits, and Du and Dong (2009) discuss the possibility that this roll-back may have affected female labor supply.

Concerned about social instability from increased unemployment, local governments attempted to introduce several different types of social welfare programs to support displaced workers.³ These programs primarily targeted displaced state-owned sector workers, rather than displaced workers from the collective-owned sector. Laid-off workers who were not re-employed were pushed into the informal sector, remain unemployed, or exited the labor force.

Giles et al. (2006a) documents the limited coverage and effectiveness of these programs. They cite reports that many cities and enterprises lacked sufficient funds to reach a large share of the dislocated workers who in principle should have qualified for benefits. Giles et al. (2006a) note reports of protests over wage and pension arrears, and the decline of health insurance coverage. They also note that cash-strapped municipal governments lacked the ability to enforce high mandated benefit contributions from enterprises. Analyzing the labor

³Appendix A.2 gives a more detailed description of these programs.

force survey from 5 large Chinese cities, Giles et al. (2006a) found that workers experienced sharp declines in health benefits but that affected urban workers faced only modest levels of wage and pension arrears. They also found that public assistance programs for dislocated workers were limited in coverage, with most relying upon private assistance to support consumption, mainly from other household members.

Another contextual factor to consider is the gender differentiated- retirement policy. Du and Dong (2009) note that the earlier retirement policies may have had an influence on the re-employment rates of females during this restructuring period. Du and Dong (2009) discuss how China's gender-differentiated retirement policy could have affected female re-employment rates. This policy requires that men require at age 60, while more highly educated white-collar women retire at age 55 and less-educated blue-collar women retire at age 50. Giles et al. (2006a) also notes the aggressive use of early retirement to reduce payrolls. From their analysis of self-reported reasons for leaving the labour force, they find that females experienced much more forced involuntary early retirement, which provides evidence of the involuntary nature of job separations among older women.

4 Explanations for the Increasing Employment Gender Gap

I first describe a simple theoretical framework of transitions between states that will clarify understanding of how different explanations lead to an increase in the employment gender gap in China. Privatization can be characterized as a dynamic re-allocation of employees from the state sector, which includes state-owned and collective enterprises, to the private and non-employed sector. More specifically, privatization can be characterized as individual transitions from the state sector to the non-employed sector. Given the the arrival into the non-employed sector, after each time period, there is a probability that individuals transition to employment in the private sector. Given the massive shrinkage of the state sector, we assume that individuals who leave the state sector can no longer re-enter the state sector. The transitions between the state sector, non-employment, and the private sector can be characterized by hazard rates. Let $\lambda_i^s(j)$ be the hazard rate of individual i from the state sector to non-employment in period j , and let $\lambda_i^n(j)$ be the hazard rate of individual i from non-employment to the private sector in period j . Those individuals who leave the state sector and soon become re-employed can be thought of as having a high hazard probability out of the non-employed sector and into the privately employed sector. During privatization, the observed cross-sectional rate of non-employment at any given point of time, $NE(t)$, is a

function of $\lambda_i^s(t)$ and $\lambda_i^n(t)$. The higher the hazard rate out of state sector employment into non-employment, the higher the observed cross-sectional non-employment rate. In addition, the lower the hazard rate out of non-employment into private sector employment, the higher the observed cross-sectional non-employment rate. To the extent that we observe a growing gap in male and female employment rates, the greater the gender differences in either $\lambda_i^s(j)$ or $\lambda_i^n(j)$.

The following potential explanations can be clearly understood in terms of how they affect the various hazard rates described above.

4.1 Gender-Asymmetric Privatization (GAP)

There is evidence that females were disproportionately allocated out of the state sector, which would shift the hazard rates from state employment to non-employment of females relative to males ($\lambda_m^s(j), \lambda_f^s(j)$). Table 1 shows, using a variety of data sources, that the state sector became more male-biased as privatization progressed, with the sex ratio (defined as males per 100 females) increasing as the share of state-owned employment decreased. This trend implies that many more females than males were re-allocated to the private or non-employed sector. "Gender-Asymmetric Privatization" (GAP) describes how females may have been disproportionately re-allocated out of the state sector simply because of the industry-specific nature of privatization. Several commentaries about the enterprise reform during this time, including Yang (2005), discuss how the "light" industries that were more likely to be privatized were female-dominated, while the "heavy" industries that remained largely state-owned were male-dominated. To the extent that female-dominated industries experienced greater privatization, female non-employment would be observed to be higher than male non-employment. In terms of the framework above, this corresponds to females experiencing a higher $\lambda_i^s(j)$ relative to males.

4.2 Discrimination

The growth of the gender gap in urban employment may also be due to pre-existing discrimination on the part of firms. Perhaps managers of newly privatized enterprises are now free to hire and fire according to preferences that may include a disutility for females. Or they may have hired and fired according to a belief in the lower marginal productivity of females. Or, firms rationed a scarcer number of jobs to males because of a cultural belief that it is more socially valuable for males to be employed.

These various forms of discrimination would correspond to gender differences in both $\lambda_i^s(j)$ and $\lambda_i^n(j)$, as discrimination would increase the probability of females leaving the

state sector to non-employment while also decreasing the probability of females leaving non-employment into the private sector.

We note that this type of "pure" discrimination is an ad-hoc explanation that could be potentially used to rationalize almost any result.

The empirical evidence in China is inconclusive about the type of discrimination at work. In an analysis of firm marginal productivities and wages, Zhang and Dong (2008) find suggestive evidence of wage discrimination among domestic private enterprises. Du and Dong (2009) analyzes gender differences in unemployment durations and presents suggestive evidence that re-employing firms discriminate against married females.

We now describe mechanisms that affect only the hazard rate out of non-employment into private sector employment.

4.3 Gender differences in Labor Supply

Privatization may cause pre-existing gender differences in labor supply to manifest. Theoretically, this means that female and male labor supply curves are simply different, and that the labor demand shifts from privatization are manifesting the differences in the labor supply curves. These gender differences may originate from preferences (perhaps formed by social norms) about the comparative advantage of female labor in household chores and care of children and elders.⁴ As the Chinese state retreated from its rhetoric about gender equality (and other implicit subsidies of female labor) during the 1990's, females may have had more freedom to express their preferences to supply labor at home. And it may be the case that preferences for females to work at home are cohort-specific rather than age-specific.

Gender differences in labor supply would correspond to females having a lower hazard rate out of non-employment ($\lambda_i^n(j)$).

4.4 Shifting Female Labor Supply

Another reason for the increase in the gender gap in employment may be that females are shifting their labor supply to the left of male labor supply. There are several mechanisms that could lead to female labor supply shifting. All of the mechanisms described below correspond to females having a lower hazard rate out of non-employment ($\lambda_i^n(j)$) relative to males.

⁴Indeed, it has been documented that even during the centralized planning regime of Maoist China, during which gender equality was stressed and enforced, women still performed most of the unpaid work at home (Croll, 1983; Wolf, 1987; Stacey, 1983). There were also anecdotal reports of females working less hours than males because of demands at home.

One possibility is that the economic liberalization of the Chinese economy corresponded to a change in cultural values about roles of women in society that shifted the preferences of females regarding labor and leisure in way that females decided to shift their labor supply curve leftwards. These cultural value shifts could have been propagated by Chinese government media, or could have been due to greater exposure to Western media, or perhaps linked to greater exposure to different cultural values through increased domestic and international trade. It is noted that this explanation can be used as an ad-hoc explanation to explain any type of difference in subpopulations.

Another way the female labor supply curve may shift is that there are time trends in household structure that may change female labor supply. For example, the decreasing child dependency ratio and increasing adult dependency ratio from the onset of the One-Child fertility policies in the late 1970's could be exerting family pressure such that females decreased their labor supply, as there may be strong social norms about females staying home to take care of elderly and children.

Another mechanism is via the roll-back of state-provided programs that affect female labor supply. Specifically, Liu et al. (2010) describe the roll-back of health care, childcare, and education that occurred during the enterprise restructuring. Females, whether due to social norms or real comparative advantage, may respond to the disappearance of these programs by choosing to remain at home to care for children and other members of the household. For example, the pulling back of firm-provided social welfare decreased pension payments to elderly retired that may have affected female labor supply as they may have felt burdened to care for their parents or in-laws. Indeed, Liu et al. (2010) find that married females caring for in-laws in urban China is significantly associated with a sizable, negative effect on her probability of employment and hours of paid work.

Another mechanism that could have caused female labor supply curves to shift to the left of male labor supply curves is the strategic labor supply response of wives if husbands experience an exogenous increase in income. It could be that privatization cause an increase in male income that induced wives to shift their labor supply to the left. An analysis of male wages can address this hypothesis.

4.5 Within-Industry Technological Change and Cross-Industry Shifts

Another mechanism could be that privatization is correlated with some combination of shifts in industry composition and shifts in within-industry composition that would produce a gender gap in employment. For example, the relative growth of male-dominated industries relative to female-dominated industries could be behind the growing gender gap in employment.

This could be driven by changing access to international export markets, via changes in tariffs, or China's 2001 entrance into the WTO. Or, many privatizing industries, experiencing within-industry "technological change" shifted their production functions such that the industries needed to hire relatively more males and relatively less females. As with the previous explanations, this mechanism also translates to male hazard rates out of non-employment being higher than female hazard rates out of non-employment. We note that this can also be used as an ad-hoc explanation that could be potentially used to explain any heterogeneity in the effects of privatization on different subpopulations.

4.6 Ownership-Specific Human Capital

Lastly, I propose that privatization may affect employment differently across gender, age, and education categories because of a theory of "ownership-specific human capital" (OSHC). I develop this concept with previous work on "industry-specific human capital" (ex. Neal (1995)) in mind, along with the literature on the labor market experience of transition economies, specifically Brainerd (1998). This theory is similar to existing descriptions of industry-specific human capital, and one can even think of ownership sector as another type of industry category scheme.

I describe two distinct formulations of Ownership-Specific Human Capital, both of which have similar empirical implications.

The first formulation describes how firms value accumulated stocks of ownership-specific human capital that are embodied in workers. This formulation is motivated by not only the previous literature on industry-specific human capital, but also previous empirical work in China suggesting the existence of these ownership sector-specific skills. Lee (2000) discusses the issue of "skills mismatch" during the urban public sector enterprise reforms of 1990's China and documents how the *xiagang* population were not qualified to fill newly created position that demanded higher education levels and technical competence. In one city, almost half of all publicly advertised jobs asked for college-educated candidates, while only 4% looked for those with less than junior high school attainment. Meanwhile, Giles et al. (2006b) and Du and Dong (2009) analyze unemployment durations in urban China during these enterprise reforms and find that their measures of social networks are significant and important in unemployment durations in the new, more marketized environment.

The second formulation describes how firms in the newly privatizing and decentralizing labor market consider the returns to human capital investment in their employment decision, which involves considerations of the projected tenure of a potential employee. The "Accumulated Capital (AC)" and "Investment Returns (IR)", only affect the hazard rate

from non-employment into private sector employment.

Both the "Accumulated Capital" formulation affects both exit rates from the state sector and entry rates into private sector employment.

4.6.1 Formulation 1: Accumulated Capital (AC)

Under this "Accumulated Capital" formulation, any person in the labor market possesses a set of skills that human capital comprises. These skills can be divided into two categories: skills that are relatively more useful in the old system of centralized production activities by state-owned enterprises operating under soft budget constraints, and skills that are relatively more useful in the new environment of private enterprises facing hard budget constraints. Examples of skills more useful in a privatized firm environment are training in finance, accounting, and other skills related to managing an enterprise with hard budget constraints. Another example of human capital that is specific to the private sector is private social networks, i.e. friends and relatives, that are relatively more valuable in job search in a privatized labor market environment. As for state sector-specific skills, Brainerd (1998), in her study of the labor market transition in Russia, notes that Soviet managers were highly skilled in supply procurement, negotiating government subsidies, and maximizing output.

Meanwhile, firms hire and fire workers according to the stocks of accumulated human capital relevant to the industry and ownership sector of the firm.

We now describe the "law of motion" for the stock of sector-specific skills. These sector-specific stocks of skills (human capital) accumulate as an increasing function of tenure in that particular ownership sector. Sector-specific human capital stocks increase with the amount of work experience spent in that sector, so that older workers with more experience under a centralized economic regime with state-owned enterprises have more sector-specific human capital.

The accumulation of generalized human capital and sector-specific capital also depend on educational attainment, and this relationship can manifest through several mechanisms. For example, more formal education may provide general skills that are applicable to wider variety of industry and ownership environments. An alternative mechanism is that the more educated have wider social networks that allow them to move more easily across ownership sector. Another possible mechanism is because of the correlation between educational attainment and the on-the-job skills the worker accumulates. Specifically, lower skill jobs may tend to require workers to specialize on a smaller set of more specific tasks that may be less applicable to a new market environment, while higher-skill workers are assigned a wider variety of tasks that allow them to adapt to new ownership environments more quickly.

Meanwhile, we assume that the nature of education was changing along with economic

changes. Whereas schooling under the centralized production regime under Mao and the 1980's focused on skills that were more relevant for the state sector, we assume that schooling in the 1990's began to teach skills that were more relevant to the private sector.

Hence, younger cohorts received more education in private sector-specific skills while older cohorts received education primarily in state sector-specific skills.

Then one theoretical prediction for this "Accumulated Capital" formulation of firm hiring is that older workers are at a disadvantage in the transitioning market because they possess relatively less private sector-specific human capital. Another prediction is that the less-educated are at a disadvantage in the transitioning market environment given their relatively lower stock of generalized or private-sector-specific skills. In terms of hazard rates, both older and less-educated workers experience a higher hazard rate out of state sector employment to non-employment, and a lower hazard rate out of non-employment to employment.

I note that, in this description of OSHC, there is no gender discrimination by firms, nor inherent gender differences in preferences or ability in this theory. The only method by which gender differences in employment would manifest is through gender differences in accumulated sector-specific capital. Given the emphasis on gender equality in labor force participation during the pre-1978 era under Mao, and also given the low returns to education under the centralized production regime under Mao and in the early 1980's, it is reasonable to assume no significant gender difference in work history or ability to accumulate various types of skills important for the state-owned sector.

4.6.2 Formulation 2: Investment Returns (IR)

The second formulation of ownership-specific human capital assumes that firms in the privatizing environment care about developing skills (human capital) in the labor force that are not already present, while state-owned enterprises do not care about developing these skills. I assume that, previously, the state-owned enterprises comprising the vast majority of employment in the 1980's and early 1990's did not care about investing in the skills (human capital) of the labor force, while the privatizing enterprises in the mid-to-late 1990's and beyond began to care about the development of skills (human capital) in its workforce. While in this formulation the skills that the privatized firm is interested in developing may be firm-specific or industry-specific, I classify this mechanism as "Ownership-Specific Human Capital" because it is firms in the private sector that care about developing skills and human capital.

I justify these assumption as follows. I assume that skills (human capital) are needed to increase productivity, and that before the SOE restructuring reforms beginning 1992, SOEs did not need or develop these skills in the labor force. One potential reason for this

is that, because of soft budget constraints, SOE's in the early 1990's did not have as much of an incentive to increase productivity, and thus less of an incentive to invest in skills (human capital). Another possible reason is that, in the pre-1992 period, what mattered for firm production (and revenue) was social networks, ("political" or "social" capital), rather than skills that would be classified under human capital. Indeed, I interpret the literature showing that observed wage returns to education were low in the late 1980's and early 1990's⁵ as evidence in support of the state-owned sector's low investment in skills and human capital before the beginning of SOE restructuring in 1992.

Meanwhile, during the restructuring period after 1992, I assume firms becoming privatized began to care about developing skills and human capital in the labor force. One explanation for why firms began to care about developing skills is that these firms had much stronger incentives to increase the productivity of the work force, while the the employee population, which had been working in the state-owned sector with low returns to skill, lacked the necessary skills required by the new and growing private sector. Firms faced strong incentives to increase productivity because they faced strong incentives to maximize profit, as they not only faced hard budget constraints, but marginal incentives of shareholders and management became aligned as ownership was typically sold to managers during the corporatization process. As before, I interpret the substantial increase in returns to education corresponding to the SOE restructuring period⁶ as evidence for increasing firm demand for both actual accrued skills as measured by education, but also demand for potential skills that can be developed. In fact, in the context of a signaling interpretation of educational attainment in the labor market, in which educational attainment is a signal for ability to learn, one could argue that education is viewed as a predictor for the future skills that can be developed.

I describe a simple investment game that describes how skills are developed at a particular firm. As with models of the production of human capital in education, developing skills on the job requires an investment of time and resources on the the part of the firm, the worker, or, typically, both. For simplicity, the below model assumes that only the employee needs to make an investment. However, whether or not the employer also needs to make an investment to produce the skills does not affect the theoretical predictions as long as the properties of the investment cost functions and investment return functions described below are the same for the employer.

⁵Zhang et al. (2005) shows that returns to education were very low in 1990.

⁶ Zhang et al. (2005) find a dramatic increase in the returns to education, from only 4.0 percent per year of schooling in 1988 to 10.2 percent in 2001. The authors note that "most of the rise in the returns to education occurred after 1992 and reflected an increase in the wage premium for higher education", which corresponds to the beginning of enterprise reforms via Deng Xiaoping's 1992 Southern Tour.

Upon being hired, the employee in period 0 chooses the amount of investment to make in period 1, I , to maximize the discounted value of income subject to the resource constraints of a cost function of investment, $c(I)$. The cost function is assumed to be a convex function of I . Further, let the investment I be used to produce a bundle of skills that directly relates to output (or productivity) in future periods. These skills can be a combination of firm-specific, industry-specific, and private sector-specific skills.

The returns to investment I made in period 1 are the work output α that the firm collects in each period of periods 2 through N , where N is the number of working periods in that ownership sector. I assume α is a concave, increasing function of the employee's initial investment I . The revenue produced from the employee i in period j is proportional to her output α , so that $R_i^j = k\alpha$. Further, I assume that worker income is a constant fraction of this revenue, so that $w_i = \delta\alpha$, where $\delta = k'k$.

The first-order condition for the optimal level of investment is

$$c'(I) = \sum_{j=2}^N \frac{\alpha'(I)}{(1+r)^j} \quad (1)$$

Prediction 1. $I^*(N)$ is increasing in N for every N .

Proof I show that $I^*(N+1) > I^*(N)$ for every N . For every N , adding another period perturbs the equilibrium by adding another term and increasing the RHS of the first-order condition in Eq. 1. If α is concave in I and $c(I)$ is convex in I , then there must exist a new equilibrium investment level $I^{**} > I^*$ such that $c'(I^{**}) = \sum_{j=2}^{N+1} \frac{1}{1+r}^j \alpha'(I^{**})$, as $c'(I^{**}) > c'(I^*)$, which increases the marginal cost side of Eq. 1, and $\alpha'(I^{**}) < \alpha'(I^*)$ which counteracts the increase of the marginal benefit (RHS) side of Eq. 1.

In other words, the optimal level of initial investment I^* increases the longer the projected tenure at the firm, industry, or ownership sector, depending on the type of skill being invested in. Assume for simplicity that the skills needed are all firm-specific so that N represented predicted tenure at the firm. This means that the longer the predicted tenure at the firm, the more the employee will invest.

Prediction 2. Say that person i has a cost function of $c(I)^i$, and person j has a cost function of $c(I)^j$. If $c'(I)^i > c'(I)^j$ for every I and I^{j*} and I^{i*} exists and is unique, then $I^{j*} > I^{i*}$.

Proof Assume that there exists a set of optimal investment levels I^{i*} and I^{j*} that satisfy Eq 1 for the individuals with cost functions $c^i(I)$ and $c^j(I)$, respectively. The I^{j*} must be such that the marginal benefit term of Eq. 1, $\sum_{j=2}^N \frac{1}{1+r}^j \alpha'(I)$, is smaller for person j because

of her assumed lower marginal costs of investment. Since $\alpha(I)$ is concave, $\alpha'(I^{j*})$ is less than $\alpha'(I^{i*})$ when $I^{j*} > I^{i*}$.

The second prediction is that the optimal level of investment I^* is higher for those with lower marginal costs of investment. In other words, the easier it is for the employee to invest in skills, i.e. the easier it is for the employee to learn, the higher the level of investment. If education decreases the cost of investment in human capital, then higher-educated employees make a larger optimal investment.

Prediction 3. $I^*(N + 1) - I^*(N)$ is decreasing in N .

Proof As N becomes larger, adding another period disturbs the original FOC equilibrium by a smaller amount as the marginal term $\frac{\alpha'(I)}{(1+r)^{N+1}}$ decreases as N increases and approaches 0 as N approaches infinity. Because $c'(I)$ is an increasing function and $\alpha'(I)$ is a decreasing function, a smaller marginal increase in the marginal benefit side of Eq. 1 implies a smaller change in I^* .

In words, the marginal increase in optimal investment for every increase in the periods N becomes smaller as N becomes larger. Restated, this means that marginal increases in N at an already large tenure horizon of N do not affect initial investment levels much.

Meanwhile, firms care about maximizing the present discounted value of revenue per employee, $R_i = \sum_{j=2}^N \frac{k\alpha(I^*)}{(1+r)^j}$, since firm profit is proportional to revenue.

Another prediction is that firms prefer employees with larger N .

Prediction 4. Let N^i be the projected tenure of individual i , and let N^j be the projected tenure of individual j . Then $R_i > R_j$ when $N^i > N^j$, all else equal.

Proof The first part of the proof is that, holding I^* constant $R_i = \sum_{j=2}^N \frac{k\alpha(I^*)}{(1+r)^j}$ is increasing in N . The second part is that I^* increases with N , as previously shown. If I^* increases, then R_i increases, since α is an increasing function of I .

We note that whether firms prefer higher or lower-skilled employees is ambiguous as it depends not only on the firm production function, but also the market wage structure of high-skilled and low-skilled employees.

Prediction 5. $R_i(N + 1) - R_i(N)$ is decreasing in N .

Proof. The marginal revenue from adding another period is $\frac{k\alpha(I^*)}{(1+r)^{N+1}}$, and this value decreases as N becomes larger.

This means that the contribution of N to revenue per employee is largest at smaller values of N . In other words, firms care more about predicted tenure at smaller levels of tenure.

In this formulation, the only way in which gender differences would appear is if there are gender differences in the time horizon of collecting returns to investment, or if there are gender differences in the cost function of investment. This comment predicts the future analysis that will exploit the gender differences in time to retirement.

Lastly, I note that the Accumulated Capital (AC) and Investment Return (IR) formulations of the theory of Ownership-Specific Human Capital have empirical implications that are quite similar. Both predict that older and lower-educated workers are at a disadvantage in a privatizing labor market. It is because of this reason that the industry-specific human capital analysis in Neal (1995) and Han and Suen (2011) cannot distinguish between these two formulations.

5 Empirical Strategy

To establish the causality behind privatization and employment outcomes, along with the testing of some of these mechanisms, I analyze the reduced form impact of regional variation of privatization on employment outcomes. If it can be shown that plausibly exogenous measures of privatization can substantially explain, in both the economic and statistical sense, the variation in regional employment shifts, it provides convincing evidence against any period-specific explanations, such as time-specific shifts in household structure, or time specific preference shifts. In addition, appropriate controls will also be included to test some of the proposed mechanisms. For example, controls for household structure will be added to test for the importance of household structure in shifting female labor supply. Another example is that proxies for within-industry and cross-industry shifts in labor demand (presumably from technological change and increased in access to international markets), will be developed and included in the analysis.

After describing the empirical strategy and data used, I will develop empirical predictions for each possible mechanism in Section 5.5.

Supplementary analysis attempts to distinguish between the two formulations of ownership-specific human capital by exploiting the fact that there are gender differences in official retirement age. Further details about the data and the analysis are given in Section 6.1.

Finally, an analysis of the impact of privatization on wages is conducted to be able to test the validity of a few more hypotheses.

5.1 Estimating the Causal Impacts of Privatization

While privatization involves a complicated process of laying off, restructuring, and the creation and entrance of new firms, we simplify our description of privatization by decomposing it into two parameters of interest: the extent (or magnitude) of privatization and the sex ratio⁷ (gender composition) of privatization. Theoretically, the privatization process can be described with two variables, one measuring the magnitude of privatization, and the other measuring the gender composition of privatization. The magnitude of privatization is related to the hazard rate out of state sector employment into non-employment ($\lambda_i^s(t)$); a greater magnitude of privatization means a higher hazard rate. The gender composition of privatization is related to the relative hazard rates of females and males ($\frac{\lambda_m^s(t)}{\lambda_f^s(t)}$). Motivated by previous literature in regional economics constructing share-shift employment growth proxies, I develop two proxies corresponding to these two measures for privatization.

The sex ratio of privatization is of particular interest because of evidence that privatization was not gender-neutral. Table 1 shows that as time progressed and public sector employment shrank, it also became more male-dominated, suggesting that females had disproportionately left the public sector, i.e. the female hazard rates out of state employment was significantly higher than the male hazard rates.

Here we develop a plausibly exogenous proxy of privatization to analyze the reduced form impact of two measures of privatization on various employment outcomes.

Using these proxies, I analyze the reduced form, causal impact of the magnitude and gender composition of privatization on employment and wages, with a particular interest in its effects among subpopulations.

To fix concepts, I describe a measure of the "actual" extent of privatization ($PRIV$) in a locality. It is simply the difference between the share of state-owned employment in period $t - 1$ and t . Formally, this is

$$PRIV_i = E_{i,t-1}^s - E_{i,t}^s \quad (2)$$

where $E_{i,t}^\tau$ is the share of workers employed in sector τ , prefectural city i , and time period t , and $\tau = s$ indicates the state/public sector and $\tau = p$ indicates the private sector. $PRIV_i$ is positive when a particular industry increases the share of private ownership and is negative when the industry increases the share of collective-owned or state-owned employment.

The sex ratio of privatization ($SRPRIV$) in a given locality is the ratio of the extent of privatized males to the extent of privatized females, $\frac{PRIV_i^m}{PRIV_i^f}$, so that

⁷The sex ratio is defined in this article as the ratio of males to females multiplied by 100 to generate units of males per 100 females.

$$SRPRIV_i = \frac{E_{i,t-1}^{s,m} - E_{i,t}^{s,m}}{E_{i,t-1}^{s,f} - E_{i,t}^{s,f}}. \quad (3)$$

where $E_{i,t}^{\tau,g}$ is the share of workers of gender g employed in sector τ , prefectural city i , and time period t , and where g indicates male ($g = m$) or female ($g = f$).

However, estimates using $PRIV_i$ and $SRPRIV_i$ may be biased because both of these measures may be endogenous. More specifically, the extent and gender composition of privatization could also be influenced by an omitted variable, labor supply, that also influences the outcome of interest, employment changes. For example, private companies may be more eager to enter location in which there is more male labor supply, which affects the magnitude of privatization, and gender differences in labor supply may affect the gender composition of which workers to release from state-owned employment.

Thus we construct plausibly exogenous analogues to these endogenous measures, the predicted extent of privatization (\widehat{PRIV}) and the predicted sex ratio of privatization (\widehat{SRPRIV}) by exploiting the wide regional variation of industry composition and the wide industry variation of privatization. The methodology is inspired by the construction of share-shift labor demand indices first used by Bartik (2002). In this setting, we interpret privatization as a negative shift in labor demand.

We define the predicted extent of privatization as the weighted average of the industry privatization rates in a particular locality, with the weights determined by the industrial composition of a locality of base period b ,

$$\widehat{PRIV}_i = \sum_j E_{i,b}^j (PRIV^j), \quad (4)$$

where the subscript j indexes industry. $E_{i,b}^j$ is the share of workers in prefecture i employed in industry j during base year b . $PRIV^j = E_{t-1}^j - E_t^j$.

We define the predicted sex ratio (SR) of privatization as the ratio of predicted male extent of privatization and predicted female extent of privatization:

$$\widehat{SRPRIV}_i = \frac{\widehat{PRIV}_i^m}{\widehat{PRIV}_i^f} \quad (5)$$

where

$$\widehat{PRIV}_i^g = \sum_j PCT_j^g * E_{i,b}^j * PRIV^j. \quad (6)$$

The predicted extent of privatization for each gender, \widehat{PRIV}_i^g , is simply the gender share of a particular industry during a base period interacted with the the national industry privatization rates and the local industrial composition.

In practice, the predicted privatization measures are calculated by exploiting the wide variation of local industrial composition in conjunction with variation in national industry rates of privatization. We note that these proxies focus on between-industry labor demand shifts induced by privatization and abstracts from within-industry changes due to technological change. The base period used for industry concentrations is the average between the two time periods, 1990 and 2000. This is due to the fact that new industries appeared between 1990 and 2000.

We limit the included industries to those focusing on non-local product markets, specifically all industries in the "goods" or "secondary" sector. This is because shifts in service industries may reflect labor supply and not labor demand, while shifts in manufacturing and mining employment presumably reflect external changes in product demand.

Appendix Table B.1 provides more detail about the characteristics of the industries used; industries are ranked by gender composition, from most female-dominated to male-dominated. One notices that in general, female industries were privatized at relatively greater rates than male industries, consistent with the findings in Table 1.

We have decided not to use these predicted privatization measures as instruments because of the lack of data on the endogenous objects of interest, as the data sources do not contain information on the ownership sector of employed individuals.

A model of local labor markets motivating our specification is given in Bound and Holzer (2000). It describes how in this empirical setting, China can be thought of as a collection of local labor markets experiencing different labor demand shifts. In other words, regions with similar population characteristics are randomly assigned to different "privatization" experiences, which vary by magnitude and gender composition.

This model and specification allows us to measure the extent to which demand shocks differentially affect different segments of the population. The main specification is

$$\Delta Y_{ip} = \beta_0 + \beta_1 \Delta PRIV_{ip} + \beta_2 \Delta SRPRIV_{ip} + \beta_3 \mathbf{X}_{ip} + \gamma_p + \epsilon_{ip} \quad (7)$$

where Δ is a first-order time series difference operator and $Y = E_{i,t}^m - E_{i,t}^f$ is the outcome of interest, which includes the gender gap in employment, absolute levels of male and female employment, the gender gap in wages, and male and female wage. For example, $\Delta Y_i = (E_{i,t-1}^m - E_{i,t-1}^f) - (E_{i,t}^m - E_{i,t}^f)$, measures the male-female gender gap in employment between the periods of $t - 1$ and t . X_i is a vector of control variables at the prefectural level, and v_i is an error term that is assumed to be uncorrelated with the regressors.

For dependent variables that are correlated with each other, such as changes in high skill and low skill employment rates, and changes in male and female employment rates, we estimate seemingly unrelated regressions (SUR) to improve the efficiency of the estimates. Otherwise, standard errors are clustered by province in the OLS model, or assumed homoskedastic and correlated in the case of the SUR regression models.

5.2 Control Variables

An important set of control variables we include in the regression is a measure of gender-specific industry growth related to technological progress or changes in access to international output markets, especially given China's formal entrance into the WTO in 2001. As discussed previously, the motivation for including these controls is the possibility that those industries which experienced greater privatization were also industries that were experiencing the most industry growth due to technological changes (endogenous or exogenous) or new access to international export markets. For example, the textile industry privatized significantly as shown in Table B.1, yet also experienced significant increase in access to international export markets. To the extent that industry privatization and industry growth are positively (or negatively) correlated, the effects of privatization on employment outcomes are understated (or overstated). Appendix Section A.1 provides more detail about how the industry growth controls are constructed.

Male and female industry growth proxies are added when the dependent variable is the gender gap in urban employment, as both affect the dependent variable. Only the male industry growth proxy is included when the dependent variable is the change in male employment, and only the female industry growth proxy is included it is the change in female employment.

In summary, these control variables, along with the privatization measures, account for both cross-industry labor demand shifts via privatization and exposure to international markets, and within-industry labor demand shifts due to technological upgrading.

The rest of the control variables included are those factors that affect male and/or female employment rates. These are average years of education in each locality, the share of im-

migrants, the child dependency ratio⁸, the aged adult dependency ratio⁹, the married share of the population, and the minority share of the population. In the regression, all control variables used are expressed in log units with the exception of years of education.

5.3 Interpreting β_1 and β_2

We interpret β_1 in Eq. 7 as the causal effect of a given shift in gender-neutral privatization on the dependent variable holding constant gender-specific industry growth and other labor supply factors that might affect the employment outcomes of interest. The mechanism through which this relationship operates is that greater privatization increases the hazard rate out of state sector employment ($\lambda_i^s(t)$), which would then decrease the employment rate.

The units are a shift in the dependent variable given a 1 percentage point change in the privatization share of employment.

β_2 is the reduced form effect of a shift in the gender composition of privatization (in units of males per female) on the outcome variable holding constant the magnitude of privatization and the other control variables. In terms of the framework of transition across sectors, this estimate can be interpreted as roughly corresponding to changing the relative female and male hazard rates out of state sector employment into non-employment ($\frac{\lambda_f^s(t)}{\lambda_m^s(t)}$) while holding constant the total hazard rate out of non-employment ($\lambda_i^s(t)$). A more female-biased gender composition of privatization, corresponding to a lower sex ratio of privatization, means that females experience a larger hazard rate relative to the male hazard rates out of state sector employment into non-employment.

To determine orders of magnitude, the estimate $\beta_2/10$ can be interpreted as a shift in the unit of the dependent variable given a shift in the sex ratio of privatization equivalent to about a shift from 100 males per 100 females to 110 males per 100 females.

5.4 Analyzing Wages

A similar specification is used to analyze the impact of privatization on changes in wages. Because neither wage nor income data are available in the 1990 Census, wages are imputed using data from the 1988 wave of the China Household Income Project household survey. Appendix Section A.4.1 describes the wage imputation procedure in further details.

It is noted that due to severe sampling bias in the 2005 Mini-Census documented by Jenq (2015), the data from the 2005 Mini-Census used in the 1990-2005 analysis was re-weighted

⁸The child dependency ratio is the ratio of the number of people aged 0-14 and the number of people aged 15-64

⁹The aged adult dependency ratio is the ratio of the number of people aged 65 and over and the number of people aged 15-64

using the 2000 Census as a reference dataset. Details for the re-weighting procedure are given in Appendix Section A.4.2.

Similar interpretations for β_1 and β_2 are used for the analysis on wage changes in the 1990-2005 period given in Tables 13 - 15.

5.5 Empirical Predictions

We now review the empirical predictions corresponding to the different mechanisms of how privatization affects male and female employment. Empirical predictions for how privatization affects changes in wages are discussed later in this section.

5.5.1 Privatization and Employment

Since the idea that privatization decreased employment via an increase in the hazard rate out of state sector employment (i.e. privatization increased $\lambda^s(t)$) is a basic assumption undergirding this paper, the first set of empirical predictions is about whether greater privatization leads to lower employment. If the gender-neutral magnitude of privatization proxy developed here does, to a significant, reflect the actual gender-neutral magnitude of privatization, then the estimate for the gender-neutral magnitude of privatization, β_1 , should be negative and significant in an analysis of changes in absolute levels of employment, such as the variables $\Delta MaleEmp.$, $\Delta FemaleEmp.$).

5.5.2 Gender-Asymmetric Privatization

Further, if the proxy for the sex ratio of privatization, β_2 , does, to a significant extent, reflect the actual sex ratio of privatization, then the estimate for β_2 should be negative and significant when analyzing the gender gap in employment ($\Delta Male - FemaleEmp.$). This is because as the sex ratio of privatization becomes more female (i.e. more negative), the hazard rate of females leaving the state sector into non-employment should become larger, so that female non-employment rates increase relative to male non-employment rates, resulting in a larger gender gap in employment rates.

If the economic magnitudes of these estimates are large, it would show not only a causal link between privatization and employment, but also that a large component of the growth in the gender employment gap was due to the gender-asymmetric privatization of state-owned enterprises. Further, economically large effects would show that time-trend mechanisms previously described, such as time trends in preference shifts via culture and media, or time trends in changes in household structure, are less important in explaining the changing employment gender gap.

5.5.3 Pure Discrimination

If pure discrimination by gender was a major contributing factor, this would imply that the estimate for gender-neutral privatization, β_1 , in an analysis of the change in the employment gender gap ($\Delta Male - Female employment$) would be positive and significant. The greater the magnitude of privatization, holding gender composition of privatization constant, the greater the gender gap in employment, as privatizing firms fire and hire males and females at different rates.

5.5.4 Gender Differences in Preferences & Shifts in Female Labor Supply

If female labor supply is a priori different from male labor supply, and the gender gap in employment is simply privatization inducing the demand curve to move along different male and female labor supply curves, this corresponds to slower female hazard rates from non-employment to private sector employment ($\lambda_f^n(t)$) relative to male hazard rates according to differing female preferences for labor, holding constant the male and female hazard rates leaving state sector employment into non-employment. Thus the prediction is that the reduced form effect on the gender-neutral magnitude of privatization, β_1 , is positive and significant when analyzing the gender gap in employment.

The predictions are similar for the mechanisms of shifts in female labor supply. If shifts in female labor supply occurred because of privatization-induced roll-back of childcare, welfare, and other benefits, this also corresponds to slower female hazard rates out of non-employment into private sector employment, which translates to β_1 being positive and significant.

The same prediction holds if privatization affects the gender gap in employment by exogenously increasing male income and inducing the wife's labor supply to shift leftwards, thus decreasing female hazard rates out of non-employment into private sector employment¹⁰.

I note that "Pure Discrimination", "Gender Differences in Preferences", and the "Gender Differences in Labor Supply" explanations can be also used as ad-hoc explanations to explain the heterogeneous impacts of privatization on subpopulations, specifically, the less-educated and older.

5.5.5 Within-Industry Technical Change and Cross-Industry Demand Shifts

If within-industry technical change and cross-industry demand shifts cause labor demand shifts that are different for males and females, the measures of predicted male and female

¹⁰An additional check for this explanation is to change for an increase in male wages as a response to privatization.

labor demand should be significant, as these demand shifts affect the male and female hazard rates from non-employment to employment.

5.5.6 Ownership-Specific Human Capital: Accumulated Capital

The Accumulated Capital formulation of the theory of Ownership-Specific Human Capital assumes that males and females have similar sector-specific capital stocks, all other factors equal. Therefore, this formulation predicts that β_1 would be insignificantly different from 0.

Further, because older cohorts and the less-educated have relatively more skills specific to the state sector, they are at a disadvantage in the privatizing environment. Hence, this formulation predicts that β_2 should be larger in magnitude for older cohorts and the less-educated when analyzing changes in the employment gender gap.

5.5.7 Ownership-Specific Human Capital: Investment Returns

The Investment Returns formulation yields gender differences in the response to privatization because of gender differences in retirement policy. Thus the estimate for β_1 should be positive and significant in a regression of the changes in the employment gender gap, as the effect of gender-neutral privatization should have a greater negative impact on female employment. Further, the magnitudes of the β_1 estimates should be larger for lower-skilled and older cohorts.

In addition, the estimate for β_2 should be larger in magnitude for older and less-educated cohorts as these subpopulations have lower perceived investment returns. One reason is due to the lower retirement age for lower-educated females. (As discussed previously, another reason is that lower-educated may have higher costs to learning, which lower the perceived returns on investment.) In addition, the females in the older cohorts are closer to retirement age relative to the males.

5.5.8 Summary

Table 2 gives a summary of the empirical predictions for the dependent variable of changes in the employment gender gap¹¹. It is not possible to distinguish between the Pure Discrimination and Gender Differences in Labor Supply mechanisms, and only the Ownership-Specific Human Capital mechanisms yield a prediction for the magnitude of estimates for β_1 and β_2 across different subpopulations, namely, the older and less-educated. The "Pure Discrimination" and "Gender Differences in Labor Supply" explanations would need to rely on ad

¹¹Predictions for the dependent variable of changes in male and female employment can be inferred from the predictions shown here.

hoc explanations of idiosyncratic preferences on the part of the employer or the employee to explain why different subpopulations would be differently affected by privatization.

While the Accumulated Capital (AC) and Investment Returns (IR) formulation of the OSHC theory yield similar empirical predictions for β_2 , the sex ratio of privatization, it does yield some different predictions for the gender-neutral magnitude of privatization, β_1 . The AC formulation predicts that the effect of gender-neutral privatization, β_1 , should be insignificantly different from 0 after assuming that there are no inherent gender differences in the cost of accumulating sector-specific capital, while the IR formulation predicts a positive and significant estimate given the shorter investment return horizon for females.

5.5.9 Empirical Predictions: Changes in Wages

We now turn to empirical predictions for the effect of privatization on wages. The effect of privatization on changes in wages is generally ambiguous, as the composition of the labor force is potentially changing in response to privatization. If the workforce were hold constant and only wages shifted during the privatization process, then the predictions for changes in wages would be exactly the same as the predictions previously described for employment outcomes.

However, in this setting, the composition of the workforce is changing as employment is dropping, as there is evidence of the older and less-educated being more likely to be nonemployed. In this setting both the labor demand and labor supply curve are shifting, such that predictions on the total reduced form effect on wages are ambiguous. Privatization presumably has a negative effect on wages, while the potential adverse selection out of the labor force would have a positive effect on wages. Thus the reduced form effect on wages when the quality, or composition, of the workforce is changing, is ambiguous.

However, one prediction that could be made is that according to the the OSHC theories, the less attractive subpopulations, namely, the less-educated and older for the Accumulated Capital formulation, and the less-educated, and female for the Investment Return formulation, would experience a more negative wage impact of privatization than the other subpopulations, provided the differences in quality between the older, less-educated who become re-employed quickly and those who are not re-employed are not too large.

5.6 Description of Data

The main data sources for the reduced form analysis of the impact of privatization described in Equation 7 were a 1% sample of the 1990 China Population Census, a 1 % sample of the 2000 China Population Census, and a 1-in-500 sample of the 2005 China "Mini-Census".

From these three data sets we calculated almost all of the variables used in the analysis. The data on industry-level privatization rates was gathered from the 1995 Industrial Census and the 2004 Economic census via the work of Holz (2013). PCT_{sj} is the national industry j employment share of the non-migrant urban hukou non-agricultural population of gender s , calculated from the 1990 China Population Census. Table B.1 gives a summary of industry characteristics from these data sources at the national level. It shows that female-heavy industries tended to be privatized to a greater extent.

Prefectural city units based on National Bureau of Statistics administrative borders are the unit of analysis. Figure C.1 gives a description of what a prefecture/city unit might look like. Because administrative borders are constantly changing over time, prefectural-city units were matched across Census waves according to a combination of merged geo-spatial (GIS) information of counties and manual matching based on place names. The provincial level municipalities, Chongqing, Beijing, Tianjin, and Shanghai, are coded as one prefectural observation. All provincial level administrative regions are represented except for Tibet, for a total of 30 provincial level administrative regions included in the analysis.

For the dependent variables, we include in our sample only urban hukou individuals aged 20-50 who have never migrated. We do not include any migrants to avoid issues of the endogeneity of employment outcomes for those who have migrated to a particular locality. When analyzing age subgroups we use 10-year age cohorts of ages 20-29, 30-39, and 40-49.

The 1990-2000 analysis of Tables 4-8 analyze both a full sample and a restricted sample as a robustness check. The full sample includes all prefectural units with non-missing values of the variables described in the analysis. All provinces are included, with the exception of Tibet.

The restricted sample excludes those prefectural-city observations with a predicted sex ratio of privatization that is considered an outlier. The outlier status is determined by a scatterplot of the predicted sex ratio of privatization and the predicted magnitude of privatization, given in Appendix Table C.2. This figure shows that while most observations with a predicted sex ratio of below about 2.25 follow the predicted negative correlation between sex ratio and privatization, there are a few observations above this limit that exhibit a positive correlation with privatization. Further inspection shows that these regions have a high concentration of specific male-dominated industries that became privatized at a large scale. These industries include: “Ferrous Metals Mining and Processing”, “Coal Mining and Processing”, “Non-Metal Minerals Mining and Processing”, “Non-Ferrous Metals Mining and Processing”, and “Other Minerals, Mining, and Processing.” Moreover, non-state firms in these industries tended to become even more male-dominated relative to state firms.

The advantage of analyzing both the Full Sample and the Restricted Sample is to see to

what extent the results come from variation in the prefectural observations that follow the negative correlation between predicted sex ratio and extent of privatization, and to what extent they are driven by the prefectures that generate the positive correlation.

Table 3 gives a summary of the variables for the full sample of 291 prefectural observations. The Predicted Sex Ratio of Privatization ranges from about 0.8 to about 2.88, with a weighted average of about 1.5. Not shown in the table is the fact that the aggregate Pred. SR of Privatization is about 1.29 and the estimated sex ratio of state-owned employment during 1990 in the goods (secondary) sector is about 1.46. The difference, illustrating a female-biased privatization, is about 0.17 units.

The Predicted Extent of Privatization ranges from 1 percentage point to about 45 percentage points, with a weighted average of about 8 percentage points. The measures for Pred. Male and Female Industry Growth show that Female Industry Growth was significantly less than Male Industry Growth. The variables for the change in the Employment Gender Gap show that the gap was significantly greater for the lower-educated. Migration increased significantly, the Child Dependency Ratio decreased (consistent with the onset of the One-Child fertility policies), the Aged Adult Dependency Ratio increased, the married share of the population increased, and the minority share of the population also increased.

Appendix Table B.4 gives a summary of the variables used in the similar 1990-2005 analysis of employment outcomes and wages. Furthermore, Table 12 gives a summary of the wage data used in the wage analysis.

The re-employment analysis uses the 2001 wave of the China Urban Labor Survey (CULS), a detailed survey of individuals covering 5 major cities that includes individual calendar-based work histories with detailed questions about job changes, transitions to unemployment or retirement, etc. More details of the survey are given in Appendix Section A.4.3. Appendix Table B.2 gives a summary of the variables used in the analysis for various views of the sample used in the analysis. The mean duration of non-employment spells in this sample is about 28 months. Most non-employed were previously employed in the "Government" sector.

6 Results

We now turn to the regression results, reported in Tables 4-10 for the estimates from the specification described in Equation 7. Tables 4-8 use the 1990 and 2000 Census data to analyze the 1990-2000 time period, while Tables 9-10 analyze the 1990-2005 period using the

2005 Mini-Census¹².

Table 4 reports the results for changes in the gender gap in employment (Changes in Male-Female Urban Employment) and Table 5 reports the estimates for the changes in male and female employment, respectively. Table 6 reports the same results as Tables 4 and 5 but broken down by low and high education groups. Table 7 reports results broken down by age group. Lastly, Table 8 reports results for the change in the gender gap in urban employment by age and education group.

Table 4 reports estimates for the Full Sample in Col. 1-4 and the Restricted Sample in Col. 5-8. Each set adds control variables, then province fixed effects, and then the male and female industry growth controls. The qualitative results of both sets of estimates do not differ. We note that none of the controls potentially affecting labor supply (i.e. the Child Dependency Ratio and Aged Adult Dependency Ratio) are significant. Competition from migrants does not also seem to be a factor, as the change in immigrant share estimate is insignificant.

Examining the estimates from Col. 3,4 and 7,8 in Table 4 shows that there is a significant correlation between the industrial growth and magnitude and gender composition of privatization, as the estimates for both the Predicted Extent of Privatization and the Predicted Sex Ratio of Privatization significantly change after the addition of the male and female industry growth controls. The Pred. Extent of Priv. estimate disappears in statistical significance, while the magnitude of the Pred. Sex Ratio of Priv. estimate increases. This shows that male and female industry growth actually worked to *decrease* the employment gender gap.

Meanwhile, the negative sign of the Pred. SR of Privatization estimate indicates that as the gender composition of privatization becomes more negative and female-biased, the gender gap in urban employment increases. This is in line with the empirical predictions previously discussed as it illustrates a causal link between privatization and changes in the employment gender gap.

Moreover, the Pred. SR of Privatization estimate in Column 4 of Table 4 also shows that the economic magnitude of this estimate is substantial. From our preferred specification in Col. 4, the magnitude of this estimate, -0.1365, can explain almost 45% of the change in the urban employment gender gap if one considers a counterfactual where the sex ratio of privatization was exactly the same as the sex ratio of the original state-owned employment in the beginning period of 1990. (The sex ratio of state-owned employment in 1990 was about 1.46, and the predicted sex ratio of privatization overall is about 1.29, resulting in a counterfactual sex ratio shift of 0.17. Meanwhile, the change in urban employment gender

¹²We note that the 2005 data was re-weighted using the 2000 Census as a reference dataset due to sampling bias concerns discussed in Jenq (2015). See Appendix Section A.4.2 for details on the re-weighting procedure.

gap is 5.2 percentage points.) This shows not only a causal link between privatization and employment, but also that a large component of the growth in the gender employment gap was due to the gender-asymmetric privatization of the economy.

The signs of the estimates for the male and female industry growth controls are as expected; greater male industry growth increases the gender gap in urban employment, all else equal, and greater female industry growth decreases the gender gap in urban employment, all else equal. None of the other control variables are significant in Col. 4 and 8 except for the married share of the population, showing a negative partial correlation between the married share and the change in the gender gap in employment.

As discussed in the empirical predictions (summarized in Table 2), the non-significance of the Predicted Extent of Privatization suggests a lack of evidence for a discrimination explanation, a gender differences in labor supply explanation, or shifting female labor supply explanation. Furthermore, it lends support for the "Accumulated Capital" formulation of Ownership-Specific Human Capital.

To analyze to what extent the change in the gender gap in urban employment was due to an increase in male employment or a decrease in female employment, we present results for a seemingly-unrelated regression (SUR)analysis of changes in male and female employment in Table 5. The qualitative and quantitative results for both the Full and Restricted Sample are similar. Both the male and female estimates for the Pred. Extent of Priv. are negative and significant, which is sensible; gender-neutral privatization should have a negative and significant effect on male and female employment, as previously discussed.

The test for the equality of the Pred. Extent of Priv. in the male and female regressions is significant at the 5% level for the Full Sample, and is marginally significant in the Restricted Sample. This result is inconsistent with the results from the previous the table, which suggests that the Pred. SR or Priv estimates should not be significantly different for changes in male and female employment. However, we note that while in Table 5 only male or female industry growth controls are added, Table 4 includes both male and female industry growth controls.

As for the effects of the Pred. Sex Ratio of Privatization, the estimates are positive and significant only for females, indicating that the shifting gender composition of privatization affects the increase in the gender gap in employment only through shifts in female employment. In other words, the variation in the gender composition of privatization is affecting female hazard rates out of state sector employment, but not male hazard rates.

Tables 6 - 8), which analyze the effects of privatization by age and skill subpopulations, provide further evidence for the predictions of the theory of Ownership-Specific Human Capital.

Table 6 shows the results broken down by education groups. The estimates in Table 6 show that a shift in the gender composition of privatization affects the employment gender gap significantly more among the low skilled (less than HS-educated) relative to the high-skilled. The larger impact on the lower-skilled is consistent with the predictions from the formulations of Ownership-Specific Human Capital previously described, which give specific predictions for the greater hazard rates out of state sector employment for the lower-educated and older.

Here, we also note that the estimate for the Pred. Extent of Privatization is significant and positive for the Full Sample, and marginally significant for the Restricted Sample, which is consistent with the predictions of the Investment Return formulation of OSHC.

We now turn to Table 7 to analyze the heterogeneous effects of privatization by age cohort. For both samples, the oldest cohorts are the most affected by the gender composition of privatization. It also shows that the effect of the gender composition of privatization is greatest among the Age 40-49 cohort. In the restricted sample, only the gender gap among the Age 40-49 is affected by the sex ratio of privatization, while in the full sample, all age cohorts are affected by the gender composition of privatization.¹³ These results are, again, consistent with the predictions of the two formulations of Ownership-Specific Human Capital, as it predicts that older workers, with more accumulated state sector human capital and less private sector human capital, would have higher hazard rates out of state sector employment.

The estimates for the Pred. Extent of Privatization are all insignificant, which does not support the "Pure Discrimination", "Gender Differences in Labor Supply", and "Shifting Female Labor Supply" explanations. It does support the predictions of the Accumulated Capital version of the OSHC theory.

Lastly, Table 8 shows that for the Full Sample, the Pred. Sex Ratio of Privatization affects the change in the gender gap in employment for only the Low-Skilled population, with the greatest effect for the Age 40-49 cohort. Meanwhile, for the Restricted Sample, the Pred. SR of Priv. affects only the Age 40-49 cohort. This table shows that privatization affected the less-educated and older cohorts the most. Again, these results are consistent with the theory of Ownership-Specific Human Capital.

The estimates for the Pred. Extent of Privatization are, again, largely insignificant.

Tables 9 and 10 present results of a similar analysis using data from the 2005 Mini-Census to analyze employment changes between 1990-2005. Details on how the 2005 data were weighted are given in Appendix Section A.4.2. A summary of the data used for the

¹³This means that the prefectural observations with high predicted sex ratios also had lower gender gaps in urban employment.

1990-2005 analysis is given in Appendix Section B.4.

Table 9 shows that the Predicted Sex Ratio is negative and significant, but only after Male and Female Industry Growth controls are added. Table 10 is consistent with the previous results for 1990-2000; the Pred. Sex Ratio of Privatization is significant in predicting female changes in employment, rather than males.

As for the Pred. Extent of Privatization, the estimates are insignificant.

Overall, we find consistent evidence for the Ownership-Specific Human Capital formulations given the robust results of the greater impact of female-biased privatization on changed in the employment gender gap for older and less-educated cohorts. Because β_1 is almost never significant in the various specifications, there seems to be little evidence for the "Pure Discrimination", "Gender Differences in Preferences", and "Shift in Female Labor Supply" explanations. It is unclear from this analysis which formulation of the OSHC theory is more accurate, as the estimate for β_1 is significant for the low skill population, but not for other specifications.

6.1 Analyzing Re-Employment Rates

We now attempt to distinguish between the two formulations of the Ownership-Specific Human Capital theory by analyzing the extent to which time to retirement can explain gender differences in re-employment rates, as this is one key difference between the two formulations.

Whereas the "Accumulated Capital" formulation predicts that firms are indifferent to employees if their accumulated human capital stocks are the same, the "Investment Returns" formulation predicts that firms prefer younger employees with longer working time horizons even when measures of accumulated capital are the same. This formulation implicitly predicts that firms are not only more likely to lay off the less-educated and those with shorter working horizons (the female and older), so that the hazard rates out of state sector employment are higher, but they are also more reluctant to hire these types of employees, which will affect the hazard rates from non-employment to private sector employment. This analysis will test the latter mechanism by including a measure of time until official retirement age in an analysis of re-employment rates in a sample of those non-employed.

I do this by analyzing re-employment rates from the 2001 wave of the China Urban Labor Survey (CULS), a survey that includes employment histories of urban workers during the 1996-2001 period from five major cities in China. A logit regression was used, with the dependent variable of interest being whether or not a person in a particular period was re-employed in the next period and the unit of observation being an individual-month

unit. Further details about the CULS survey data and the specification used are given in Appendix Section A.4.3 and A.5. A summary table of variables used in the analysis is given in Appendix Table B.2.

After including a rich set of control variables that can presumably measure accumulated human capital and any mediating factors that affect labor supply, I test whether measures of time horizon until the predicted retirement age can predict the gender difference in re-employment rates.

The predicted retirement age is different by gender. The CULS data shows that males retired around age 60, while high school-educated and above females retired around age 55, and less-educated females retired around age 50. Hence, I assigned the official retirement age to be age 60 for males, age 55 for high school-educated and above females, and age 50 for less-educated females.

Table 11 reports the results of this analysis. The different models include various methods of measuring the time horizon to retirement. The estimates for the control variables are provided in Appendix Table B.3. Model 1 reports the estimate for the gender gap in re-employment rates remaining after a rich set of control variables have been added. These variables include educational attainment, age, marital status, measures of nonemployment status, previous job characteristics, neighborhood-level demographic variables, measures of regional economic conditions, measures of access to nonemployment benefits and subsidies, and measures of household structure, particularly in terms of the presence of children and retirees. Model 1 shows that even after education, previous work experience, economic conditions, and household structure have been accounted for, there is a significant gender gap in re-employment rates, with females having a significantly lower probability of being re-employed. The estimated magnitude of this gap in re-employment rates is substantial, about 13% of the baseline one-year re-employment rate.¹⁴

Models 2 through 4 add different measures of the time horizon until retirement to test the importance of this variable in explaining the gender gap in re-employment rates. We calculate years to retirement according to the following rules. All men are assigned a retirement age of 60, as the data show that men's actual retirement ages, at all education levels, is primarily populated at age 60. Females with an educational attainment of high school and equivalent or above are assigned a retirement age of 55, and females with less than high school educational attainment are assigned a retirement age of 50.

Model 3 is motivated by the prediction that the marginal impact of an additional period of tenure on firm revenue is highest at low predicted periods of tenure. Hence, it is reasonable

¹⁴Details about the calculation of the change in one-year re-employment rates is given in Appendix Section A.6

to assume that the impact of years to retirement is largest for those closer to the age of retirement.

Model 2 interacts the female indicator with a measure of years to retirement for all individual-month observations. Model 3 interacts the female indicator with an indicator for whether an individual is within 6 years of the imputed retirement age (LTE6YTR), and Model 4 interacts the female indicators with both years until retirement and the LTE6YTR indicator.

Model 2 shows that years until retirement is a significant predictor of re-employment rates; the lower the number of years to retirement, the lower the re-employment rates. In fact, the significance of the female indicator disappears, providing more evidence that years until retirement is a major factor in re-employment rates. However, we note that the magnitude of the estimate, while statistically significant, it is not economically significant as a one year change in the years until retirement can only explain about 1% of the change in the baseline one-year re-employment rates. Further, the female dummy, while not significant is still economically significant at 9% of the base one-yr employment rate.

Model 3 shows that the indicator for being close to retirement is also a significant predictor of re-employment rates. Further, it is both economically and statistically significant; being within 6 years of the imputed retirement age is associated with a drop in re-employment rates that is equivalent to about 35% of the baseline one-year re-employment rates. However, the female indicator is still relatively unchanged, showing that the indicator by itself is not a robust measure for explaining the gender difference in re-employment rates.

We note that the female interaction terms in Model 2 and 3 are insignificant, suggesting that these years until retirement indicators have a similar effect on both male and females re-employment rates.

Model 4 is the full interaction of the female indicator with LTE6YTR and imputed years until retirement. Again, all the female interaction terms are insignificant, further evidence that the measures for years until retirement have a similar effect on both male and female re-employment rates. After adding these measures, the female indicator not only vanishes in significance, but the magnitude of the estimate drops to 3% of the baseline re-employment rate. Finally, the estimates show that both the LTE6YTR indicator and its interaction with the imputed years until retirement are both economically and statistically significant in explaining re-employment rates. We interpret this as strong evidence for the shortened time to retirement among older females, particularly less-educated females, as the omitted variable correlated with female status when analyzing the gender gap in re-employment rates.

Thus far, the re-employment rates show convincing evidence for the Investment Returns (IR) formulation of the theory of Ownership-Specific Human Capital, as the Accumulated

Capital (AC) formulation cannot explain why a measure for time to retirement would affect re-employment rates. More importantly, this is convincing evidence refuting the other explanations. If "Pure Discrimination" against females was practiced by firms, or females had different labor supply curves, or if female labor supply shifted in response to privatization through different mechanisms, the female indicator should re-main significant in the logit regression even after time to retirement measures were added. Explanations such as spousal income shifts or the roll-back of childcare arrangements cannot explain why adding this measure can explain virtually all of the female shortfall in re-employment rates. Further, any of the time trend explanations, such as time trends in cultural preferences for work, or time trends in household structure, cannot explain why time to retirement measures can explain re-employment rates. In addition, the explanation of within-industry technical change and cross-industry demand shifts cannot explain these results.

We also note that these results are largely consistent with related work on gender differences in unemployment and re-employment rates of dislocated workers during the enterprise privatization period in China. As discussed in Section 2, several studies on displaced workers document significantly longer average unemployment durations for women and the less educated. Even after controlling for a rich set of factors in their regression analysis, Du and Dong (2009) still find a significant gender gap in unemployment durations. The findings of Giles et al. (2006b) find that younger cohorts find employment faster than older cohorts, the better-educated find new employment more quickly, consistent with the finding that the less-educated and older were more affected. They also find that there is a larger gender gap in re-employment rates for the less-educated¹⁵.

6.2 Wage Results

We now analyze the the effect of privatization on wages in Tables 13 to 15. As previously discussed, the impact of privatization on wages is inconclusive, as both demand shifts and labor composition shifts are occurring. We hypothesize that greater privatization to have a negative effect on wage changes. However, he previous results have established that females, particularly the older and less-educated, were more likely to be non-employed. To the extent that this represents adverse selection out of the labor force, wages could *increase* to reflect the higher "quality" of those remaining in the labor force. The overall effect of privatization on wages is ambiguous because of the competing effects of lower wages from privatization, and higher wage adjustments due to potential adverse selection out of the labor force.

¹⁵Ho et al. (2003) describes a potential mechanism by which re-employment rates for the less-skilled were lower; he describes a process of a growing competition for human capital, as skilled managers and technicians became scarcer due to being lured away by private enterprises.

Table 13 reports results on overall wage changes, Table 14 reports results on changes in male and female wages, and Table 15 reports results on the change in the gender gap in wages (i.e. the difference between male and female wages). Because income and wage data are not available in the 1990 Census, wages were imputed using the 1988 China Household Income Project (CHIP) survey. Appendix Section A.4.1 describes the wage imputation procedure. Table 12 gives a summary of the wage values for the imputed 1990 wages and the 2005 Mini-Census.

Table 12 shows that our wage sample is consistent with other studies of general wage trends in the 1990-2005 period. There was a very low wage premium to education, but that drastically changed by 2005. The change in the gender wage gap (defined the difference between average male and female wages) rose by about 3.5 log points, but the increase in the gender wage gap was primarily among the lower-educated sample, with an increase of about 14 log points.

Meanwhile, the regression results in Tables 13 to 15 show that the gender-neutral magnitude of privatization had little effect on changes in overall wages, male wages, female wages, and the gender gap in wages. However, Table 13 shows that the gender composition of privatization had an effect on changes in wages, and Table 14 shows that this effect is primarily from changes in female wages, particularly among the older female cohorts. Specifically, a more female-biased privatization (i.e. a lower sex ratio), corresponds to decrease in the change in female wages. Table 15 analyzes the change in the male/female gender wage gap and shows that neither the Pred. Extent of Privatization nor the Pred. Sex Ratio of Privatization had a significant effect.

Overall, as predicted, the results on changes in wages are inconclusive. This is unsurprising given the previous discussion about the ambiguity of shifts in wages given that the composition of the workforce is changing during this period.

However, it is notable that the privatization had no effect on changes in male wages, as this provides evidence against the hypothesis that female labor supply shifted due to a spouse's increase in income from the privatization process.

Lastly, it is also notable that older female wages are the most negatively affected by the female-biased privatization. We interpret it as further evidence for the Ownership-Specific Human Capital theory. Other studies in industry-specific human capital have noted that workers with longer experience and tenure suffer larger wage losses when they change industry. This is consistent in this empirical setting in which older females, with shorter working horizons, seem to suffer larger wage losses in response to privatization.

7 Discussion and Conclusion

To summarize, the reduced form results in Tables 4-10 have shown, firstly, that the gender-asymmetric privatization of industries has contributed to the increase in the increase in the gender employment gap, explaining almost 50% of the increase in the employment gender gap. The consistently significant estimates of the effect of the Sex Ratio of Privatization on changes in the urban employment gender gap show that it is primarily female employment that is affected when varying the gender composition of privatization. Moreover, the results showing that females, the lower-educated and older, were relatively more adversely affected by this gender-asymmetric privatization is evidence in support of the mechanism of a theory of Ownership-Specific Human Capital at work in determining why different subpopulations of females are more adversely affected.

And given that Table 11 shows that measures of time to retirement can explain the gender gap in re-employment rates in the 1996-2001 period, we can not only find convincing support for an Investment Return formulation of a theory of ownership-specific human capital over the Accumulated Capital formulation, but also convincing evidence against the other explanations. Shifts in labor supply preferences, discrimination, spousal income shifts, shifts in female labor supply correlated with privatization, and within-industry and cross-industry demand shifts cannot explain why time to retirement, particularly at ages close to the official retirement age, explain re-employment rates.

In terms of the lower female supply explanation, the results from the re-employment analysis provide the strongest evidence that a lower female labor supply is the cause of the gender gap in employment, as adding an exogenous characteristic of years to retirement can entirely explain the gender gap in re-employment rates. Indeed, with respect to the explanation of gender differences in labor supply, other works have also found no evidence of systematic differences between male and female labor supply, particularly in terms of household structure. Du and Dong (2009) find no gender differences in the intensity of their job search, with both male and female workers in the sample spending about 70% of their time during unemployment searching for new jobs. They also find no evidence that males and females respond differently to dependants in the household; the presence of a child age 21 and under does not affect male or female unemployment durations differently. Giles et al. (2006b) find that neither the presence of young children nor elderly in the household affects neither male or female re-employment rates in a statistically significant manner. In fact, they find that female labor supply is *increased* for those with children aged 18-22 years, presumably to help pay for college tuition. And Liu et al. (2010), analyzing married female labor supply in the China Health and Nutrition Survey, find that the presence of young

children has no statistically significant effect on the employment status of women. The only gender differences in re-employment rates pertaining to household structure is that women with children aged 22 and above have lower re-employment rates (Giles et al., 2006b; Du and Dong, 2009); yet we note this measure is also highly correlated with years to retirement.

We also note that the consistent lack of significance on the estimates of the Pred. Extent of Privatization (β_1) on the urban gender gap, and no consistently significant difference between the corresponding β_1 estimates of changes in male and female employment, show little evidence of discrimination against females differences between in male and female labor supply.

The wage results are generally inconclusive. However, the finding that older women's wages were sensitive to the gender composition of privatization is consistent with the predictions of Ownership-Specific Human Capital. These results are consistent with other work on relative wages showing that wages of older females suffered. Giles et al. (2006a) analyze wage changes for different age groups and finds that for those less than 40 years old, wages increased, and for those 40 or greater, wages decreased¹⁶. And Zhang and Dong (2008), using firm-level data, present evidence of relative wage subsidies for females in the state sector. They find that the ratio of female to male wages is higher than the ratio of female to male marginal productivity, implying a subsidy for female labor. In addition to being less likely to be re-employed, older workers were also paid less.

Overall, we interpret the results to show that not only was the female-biased privatization a large factor in the increase in the employment gender gap, the larger negative impact on the employment outcomes of older and less-educated women is consistent with the "Investment Returns" theory of ownership-specific human capital interacting with the earlier mandated retirement ages of women, particularly lower-educated women. Those with a shorter time horizon from which to collect new investments in human capital, in this context older women who are nearing their mandated lower retirement age, are less willing to invest in new skills and thus less willing to be re-employed.

8 Conclusion

We emphasize that that these results do not mean that the other explanations, such as gender discrimination in the private sector labor market, are completely untrue. The results show that industries primarily privatized based on strategic and economic reasons, and the pattern of layoffs (including forced early retirement).

Also, we caution on making assumptions about the relative welfare of women relative

¹⁶This also provides an explanation of how returns to experience decreased over time in wage regressions

to men. As noted by Giles et al. (2006b) and Du and Dong (2009), many older females experienced a wealth increase earlier than males through the offer of early retirement pensions by their former employers, corresponding to earlier mandatory retirement ages for females. Moreover, Giles et al. (2006a) analyzes self-reported welfare among different subgroups of displaced workers and find that unemployed men age 40-55 reported the worst self-reported measures of well-being, and that men out of the labor force were more likely to report declines. Meanwhile, those near retirement age were the most satisfied, especially women, most likely due to their receipt of early retirement pensions.

Lastly, for those concerned about equalizing employment rates for males and females, policymakers should first consider the unintended consequences of females' earlier mandated retirement age. This policy makes firms relatively more reluctant to invest in the hiring of older females. In addition, older females themselves are more reluctant to learn new skills in a new ownership sector or a new industry. In general, lower retirement age mandates also decrease job mobility, as firms are less likely to hire older workers, and older workers are less willing to invest in new skills. There may also be negative implications for the career trajectories of women, as additional reasons to believe that women are less attached to the labor force may hinder valuable skill investment in women earlier on in their careers.

References

- Appleton, S., J. Knight, L. Song, and Q. Xia (2002). Labor Retrenchment in China: Determinants and Consequences. *China Economic Review* 13(2-3), 252–275.
- Bartik, T. J. (2002). Who Benefits from State and Local Economic Development Policies? *Books from Upjohn Press*.
- Bound, J. and H. J. Holzer (2000, January). Demand Shifts, Population Adjustments, and Labor Market Outcomes during the 1980s. *Journal of Labor Economics* 18(1), 20–54.
- Brainerd, E. (1998, December). Winners and Losers in Russia’s Economic Transition. *The American Economic Review* 88(5), 1094–1116.
- Brainerd, E. (2000, October). Women in Transition: Changes in Gender Wage Differentials in Eastern Europe and the former Soviet Union. *Industrial and Labor Relations Review* 54(1), 138–162.
- Brainerd, E. (2002, March). Five Years after: The Impact of Mass Privatization on Wages in Russia, 1993–1998. *Journal of Comparative Economics* 30(1), 160–190.
- Croll, E. (1983). *Chinese Women Since Mao*. Zed Books, London, United Kingdom.
- Du, F., S. Ding, X.-y. Dong, and J. Yang (2006). *Women’s Employment and Public-Sector Restructuring: The Case of Urban China*, Chapter 5, pp. 87–107. Routledge.
- Du, F. and X.-y. Dong (2009). Why do Women have Longer Durations of Unemployment than Men in Post-restructuring Urban China? *Cambridge Journal of Economics* 33(2), 233–252.
- Giles, J., P. Albert, and J. Zhang (2005). What is China’s True Unemployment Rate? *China Economic Review* 16(2), 149–170.
- Giles, J., A. Park, and F. Cai (2006a, March). How has Economic Restructuring Affected China’s Urban Workers? *The China Quarterly* 185, 61–95.
- Giles, J., A. Park, and F. Cai (2006b, September). Re-employment of Dislocated workers in Urban China: The Roles of Information and Incentives. *Journal of Comparative Economics* 34(3), 582–607.
- Glinskaya, E. and T. A. Mroz (2000). The Gender Gap in Wages in Russia from 1992 to 1995. *Journal of Population Economics* 13(2), 353–386.

- Gustafsson, B. and S. Li (2000, July). Economic Transformation and the Gender Earnings Gap in Urban China. *Journal of Population Economics* 13(2), 305–329.
- Han, J. and W. Suen (2011). Age structure of the Workforce in Growing and Declining Industries: Evidence from Hong Kong. *Journal of Population Economics* 24(1), 167–189.
- Ho, S. P., P. Bowles, and X. Dong (2003). 'Letting Go of the Small': An Analysis of the Privatisation of Rural Enterprises in Jiangsu and Shandong. *Journal of Development Studies* 39(4), 1–26.
- Holz, C. A. (2013, June). Chinese Statistics: Classification Systems and Data Sources. *Eurasian Geography and Economics* 54(5-6), 532–571.
- Hsieh, C.-T. and Z. M. Song (2015, March). Grasp the Large, Let Go of the Small: The Transformation of the State Sector in China. Working Paper 21006, National Bureau of Economic Research.
- Hunt, J. (1997, September). The Transition in East Germany: When is a Ten Point Fall in the Gender Wage Gap Bad News? Working Paper 6167, National Bureau of Economic Research.
- Jenq, C. (2015). Sampling Bias in the China Population Census since 1982. Working paper, HKUST Institute for Emerging Market Studies Working Paper.
- Knight, J. and S. Li (2006). Unemployment Duration and Earnings of Re-employed Workers in Urban China. *China Economic Review* 17(2), 103–119.
- Lee, H. Y. (2000, November-December). Xiagang, the Chinese Style of Laying Off Workers. *Asian Survey* 40(6), 914–937.
- Li, L. and X.-Y. Dong (2011, January). Economic Transition and the Gender Earnings Gap in Chinese Industry: the Role of Firm Characteristics. *Contemporary Economic Policy* 29(1), 67–87.
- Liu, L., X.-y. Dong, and X. Zheng (2010). Parental Care and Married Women's Labor Supply in Urban China. *Feminist Economics* 16(3), 169–192.
- Meng, X. (2012, Fall). Labor Market Outcomes and Reforms in China. *The Journal of Economic Perspectives* 26(4), 75–101.

- Millimet, D. L. and L. Wang (2006, February). A Distributional Analysis of the Gender Earnings Gap in Urban China. *Contributions to the B.E. Journal of Economic Analysis and Policy* 5(1), 1–48.
- Neal, D. (1995, October). Industry-Specific Human Capital: Evidence from Displaced Workers. *Journal of Labor Economics* 13(4), 653–677.
- Ogloblin, C. G. (1999, July). The Gender Earnings Differential in the Russian Transition Economy. *Industrial & Labor Relations Review* 52(4), 602–627.
- Shu, X. and Y. Bian (2003). Market Transition and Gender Gap in Earnings in Urban China. *Social Forces* 81(4), 1107–1145.
- Stacey, J. (1983). *Patriarchy and Socialist Revolution in China*. University of California Press.
- Whalley, J. and C. Xing (2010, December). The Regional Distribution of Skill Premia in Urban China. Working Paper 16575, National Bureau of Economic Research.
- Wolf, M. (1987). *Revolution Postponed: Women in Contemporary China*. Methuen.
- Yang, D. L. (2005). *Remaking the Chinese Leviathan: Market Transition and the Politics of Governance in China*. Stanford University Press.
- Zhang, J., J. Han, P.-W. Liu, and Y. Zhao (2007, January). Trends in the Gender Earnings Differential in Urban China, 1988-2004. *Industrial & Labour Relations Review* 61(2), 224–243.
- Zhang, J., Y. Zhao, A. Park, and X. Song (2005). Economic Returns to Schooling in Urban China, 1988 to 2001. *Journal of Comparative Economics* 33(4), 730–752.
- Zhang, L. and X.-Y. Dong (2008). Male?female Wage Discrimination in Chinese Industry Investigation using Firm-level Data. *Economics of Transition* 16(1), 85–112.

10 Figures

Figure 1: Male and Female Urban Employment

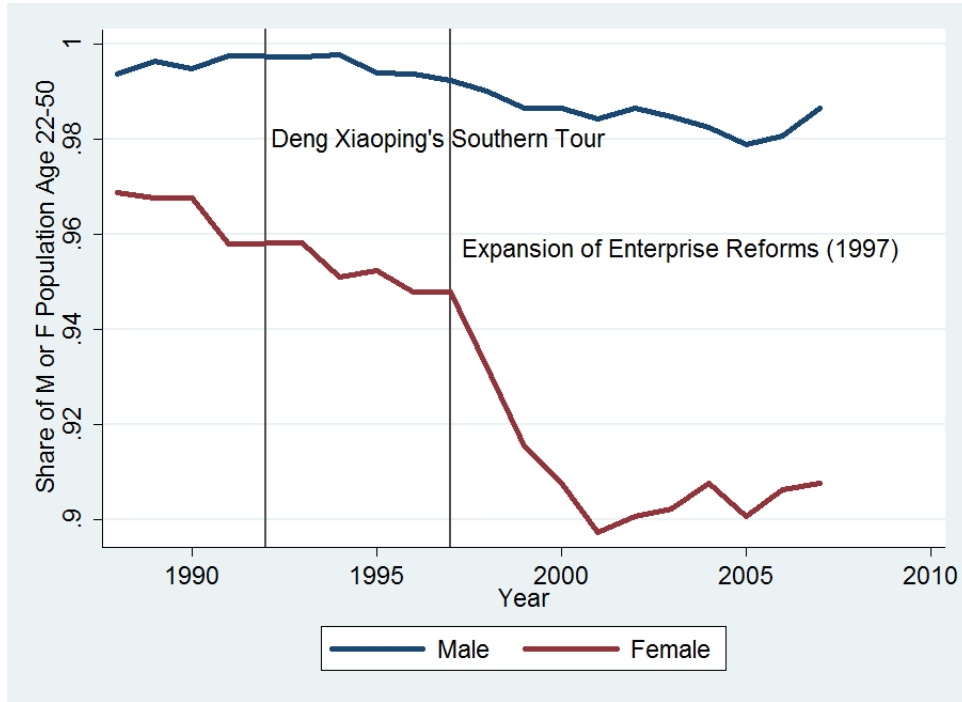


Figure 2: Male and Female Urban Employment, by Education

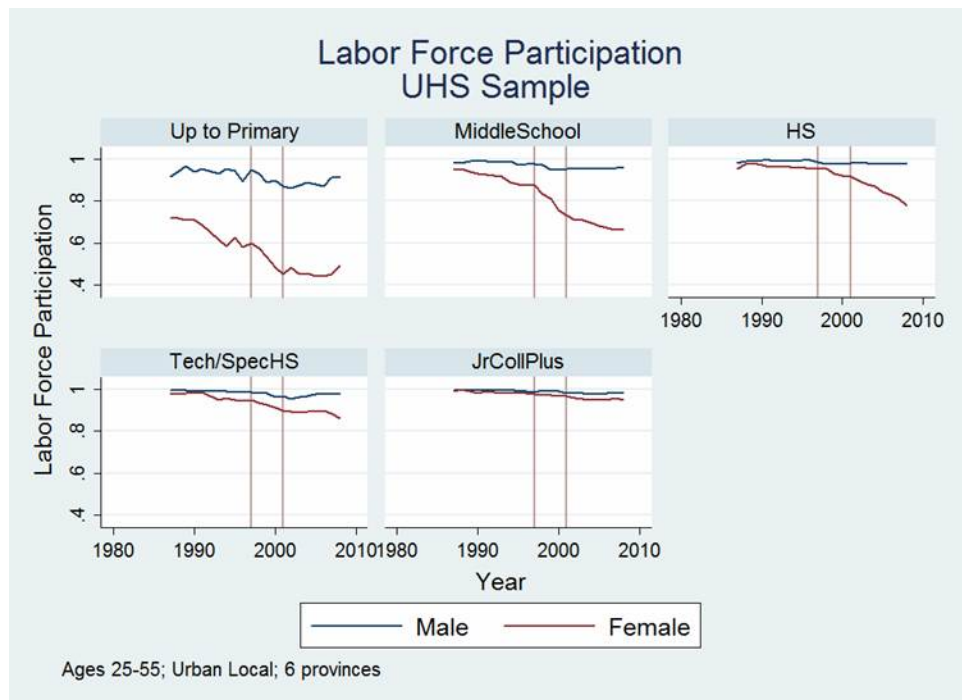


Figure 3: Male and Female Urban Employment, by Age Group

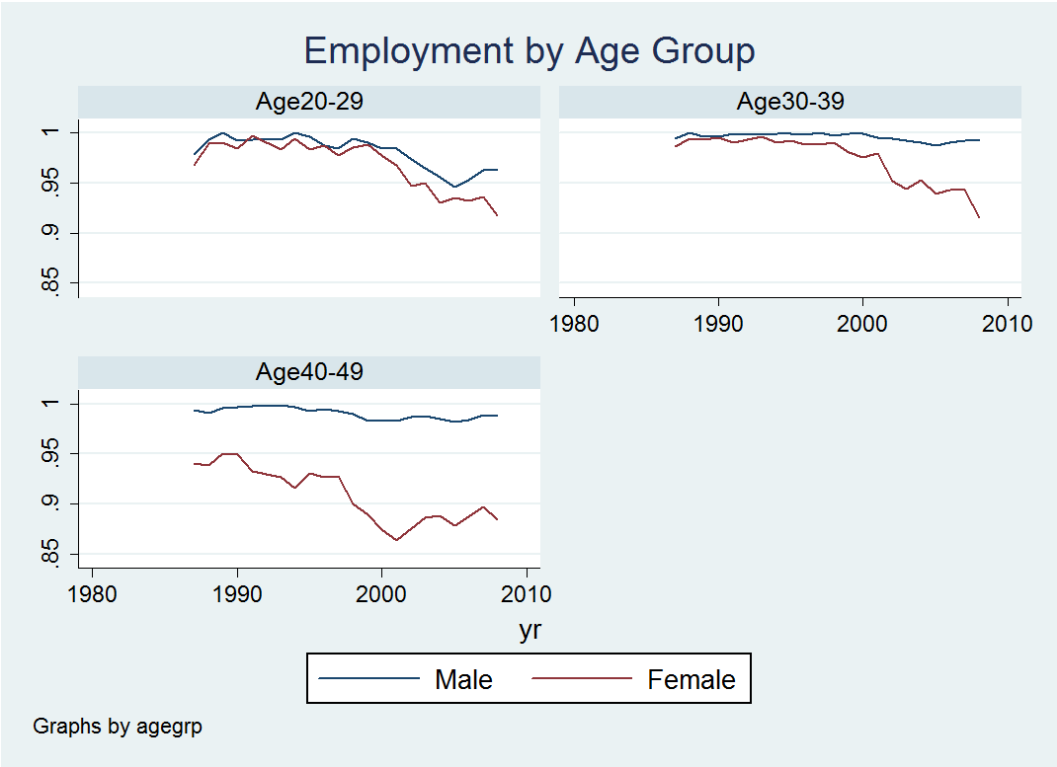


Figure 4: Urban Employment by Ownership

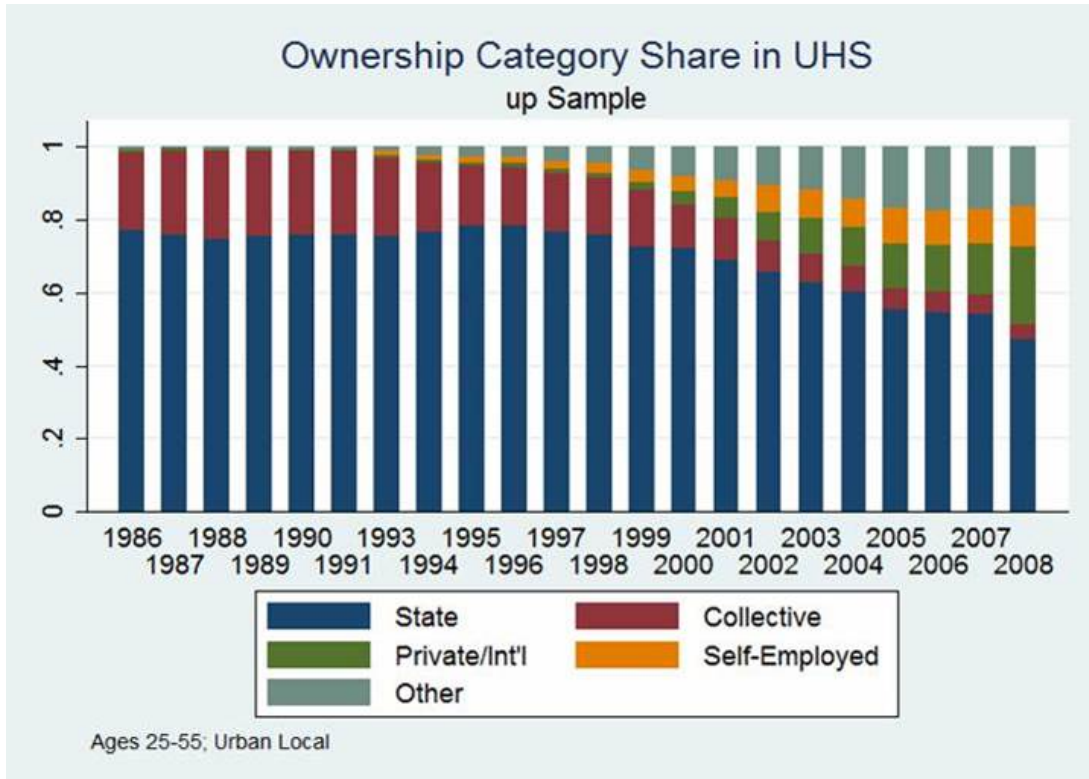
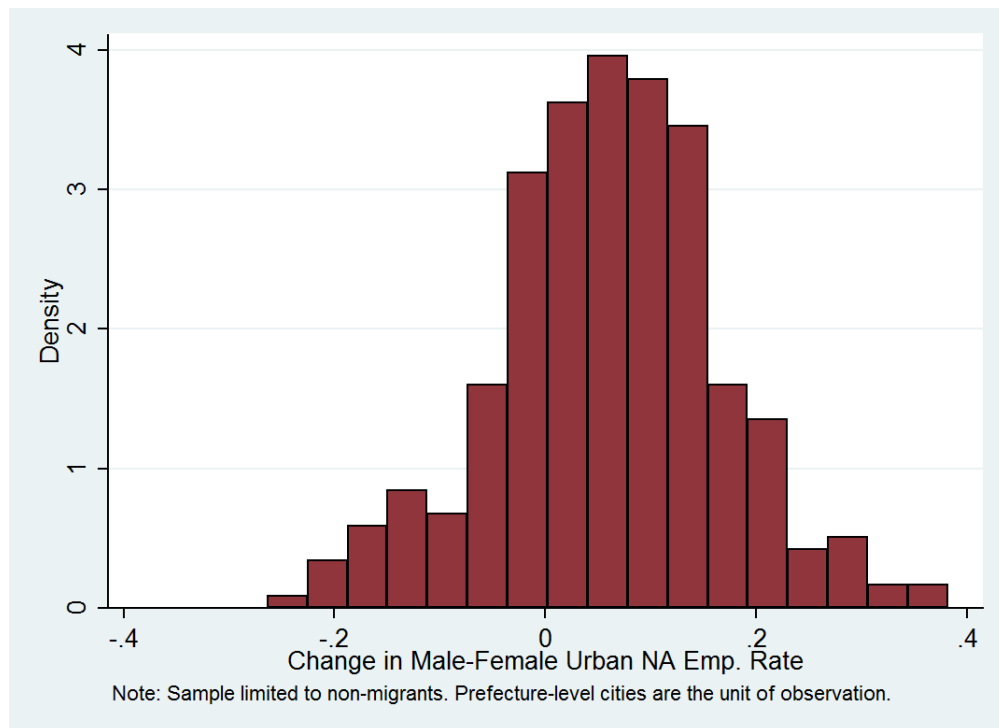


Figure 5: Variation in Urban Employment Gender Gap



11 Tables

Table 1: Aggregate SOE Emp. Share and Sex Ratio

	Urban SOE Emp. %	SR of SOE Sector
CHIP 1988	0.97	109.6
CHIP 1995	0.94	106.6
CHIP 2002	0.4	137.0
Census 2005	0.57-0.62	150.3
UHS 1988-1992	0.79	106.0
UHS 1994-1996	0.78	106.1
UHS 2003	0.63	134.5
UHS 2005	0.55	137.9

Table 2: Summary of Predictions

Dep. Var.: Mechanism	Δ Male - Female Employment		
	β_1	β_2	Notes
Pure Discrimination	+	—	
Gender Differences in Preferences	+	—	
Shifts in Female Labor Supply	+	—	Time trend explanations would predict insignificant estimates for β_1, β_2
OSHC - Accumulated Capital	0	—	β_2 : Larger magn. for older and less-educated
OSHC - Investment Returns	+	—	β_1 and β_2 : Larger magn. for older and less-educated

Table 3: Variable Summary

Variable Name	Obs	Mean	Std. Dev.	Min	Max
Pred. SR of Priv. (Males/Females)	291	1.47	0.30	0.79	2.88
Pred. Extent of Priv. (Percentage Points)	291	8.05	3.32	1.05	45.30
Pred. Male Industry Growth	291	1%	2%	-14%	5%
Pred. Female Industry Growth	291	-12%	8%	-46%	7%
Δ Emp. Gender Gap	291	5%	7%	-31%	21%
Δ Emp. Gender Gap (Less than HS)	291	8%	9%	-41%	31%
Δ Emp. Gender Gap (HS Plus)	291	4%	6%	-37%	27%
Δ Male Emp.	291	-14%	6%	-33%	18%
Δ Female Emp.	291	-19%	10%	-41%	23%
Δ Male Emp. (Less than HS)	291	-16%	7%	-40%	31%
Δ Female Emp. (Less than HS)	291	-23%	11%	-45%	29%
Δ Male Emp. (HS Plus)	291	-13%	7%	-28%	37%
Δ Female Emp. (HS Plus)	291	-17%	10%	-38%	36%
Δ Avg. Years of Educ.	291	0.60	0.39	-1.35	2.18
Δ Immigrant Share of Population (%)	291	8.49	5.15	0.28	83.41
Δ Immigrant Share of Population (Log Units)	291	2.11	0.55	0.24	4.44
Δ Child Dependency Ratio (%)	291	-0.15	0.15	-0.69	0.87
Δ Child Dependency Ratio (Log Units)	291	-0.18	0.17	-1.16	0.63
Δ Aged Adult Dependency Ratio (%)	291	0.33	0.32	-0.71	3.79
Δ Aged Adult Dependency Ratio (Log Units)	291	0.26	0.19	-1.23	1.57
Δ Married Share of Age 15-50 (%)	291	0.09	0.08	-0.20	0.40
Δ Married Share of Age 15-50 (Log Units)	291	0.08	0.07	-0.23	0.34
Δ Minority Share (%)	291	1.50	4.69	-1.00	56.38
Δ Minority Share (Log Units)	291	0.42	0.88	-6.93	4.05

Notes: Δ refers to changes between 1990 and 2000.

Table 4: Change in Male - Female Urban Employment

Dep. Var.	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
VARIABLES	Change in Male - Female Urban Employment, 1990-2000 Full Sample				Restricted Sample			
Pred. Extent of Priv.	0.0042** (0.0017)	0.0040** (0.0017)	0.0030* (0.0016)	0.0021 (0.0016)	0.0048** (0.0019)	0.0047** (0.0019)	0.0032** (0.0014)	0.0019 (0.0014)
Pred. SR of Priv.	-0.0533*** (0.0203)	-0.0605*** (0.0216)	-0.0668*** (0.0185)	-0.1365*** (0.0314)	-0.0281 (0.0219)	-0.0344 (0.0223)	-0.0403** (0.0175)	-0.1144*** (0.0324)
Δ Avg. Years of Educ.		-0.0243 (0.0207)	-0.0235 (0.0150)	-0.0229 (0.0149)		-0.0215 (0.0210)	-0.0191 (0.0153)	-0.0177 (0.0151)
Δ Immigrant Pop. Share (Log Units)		0.0173 (0.0120)	0.0024 (0.0096)	-0.0007 (0.0091)		0.0146 (0.0120)	0.0010 (0.0096)	-0.0004 (0.0091)
Δ Child Depend. Ratio (Log Units)		-0.0572 (0.0396)	0.0461 (0.0405)	0.0595 (0.0382)		-0.0433 (0.0377)	0.0553 (0.0404)	0.0642* (0.0382)
Δ Aged Adult Depend. Ratio (Log Units)		0.0056 (0.0326)	-0.0373 (0.0288)	-0.0419 (0.0279)		-0.0050 (0.0314)	-0.0475* (0.0282)	-0.0475* (0.0273)
Δ Married Share of Age 15-50 (Log Units)		0.0483 (0.0921)	-0.1232* (0.0745)	-0.1502** (0.0702)		0.0351 (0.0883)	-0.1350* (0.0714)	-0.1536** (0.0685)
Δ Minority Share (Log Units)		-0.0053 (0.0046)	-0.0044 (0.0043)	-0.0048 (0.0043)		-0.0070 (0.0046)	-0.0064 (0.0041)	-0.0065 (0.0041)
Pred. Male Industry Growth				0.9439*** (0.2484)				0.8486*** (0.2728)
Pred. Female Industry Growth				-0.3705*** (0.1270)				-0.3509*** (0.1254)
Province FE	N	N	Y	Y	N	N	Y	Y
Observations	291	291	291	291	282	282	282	282
R-squared	0.0756	0.1055	0.4092	0.4675	0.0532	0.0786	0.4032	0.4505

Standard errors clustered by province.

*** p<0.01, ** p<0.05, * p<0.1

Notes:

Table 5: Change in Male and Female Urban Employment, SUR

Sample Dep. Var. VARIABLES	(1) Full Sample		(3) Restricted Sample	
	Δ Male Emp.	Δ Female Emp.	Δ Male Emp.	Δ Female Emp.
Pred. Extent of Priv.	-0.0021** (0.0009)	-0.0045*** (0.0013)	-0.0039*** (0.0011)	-0.0060*** (0.0016)
Pred. SR of Priv.	-0.0072 (0.0114)	0.1102*** (0.0222)	-0.0169 (0.0121)	0.0786*** (0.0227)
Pred. Male Ind. Growth	0.4903*** (0.1120)		0.4649*** (0.1208)	
Pred. Female Ind. Growth		0.2650*** (0.0786)		0.2665*** (0.0802)
Prefecture Controls	Y	Y	Y	Y
Observations	291	291	282	282
R-squared	0.4647	0.5546	0.4867	0.5737
Test1:ABS=ABS		4.816		2.857
p-value		0.0282		0.0910
Test2:SR=SR		35.02		21.68
p-value		3.26E-09		3.22e-06

Standard errors calculated from seemingly unrelated regression model.

*** p<0.01, ** p<0.05, * p<0.1

Notes: All regressions include province fixed effects. Test 1 results test for the equality of the Pred. Extent of Priv. estimate for the change in male and female employment outcomes. Test 2 results test for the equality of the Pred. SR of Priv. for the male and female outcomes.

Table 6: Change in Urban Employment Gender Gap by Education, SUR

Sample Dep. Var. VARIABLES	(1) Full Sample		(3) Restricted Sample	
	Less than HS	HS and up	Less than HS	HS and up
Pred. Extent of Priv.	0.0036*** (0.0014)	-0.0001 (0.0011)	0.0029* (0.0017)	-0.0004 (0.0013)
Pred. SR of Priv.	-0.1556*** (0.0274)	-0.0762*** (0.0211)	-0.1355*** (0.0296)	-0.0587** (0.0229)
Δ Avg. Years of Educ.	-0.0265 (0.0163)	-0.0161 (0.0126)	-0.0172 (0.0163)	-0.0144 (0.0126)
Δ Immigrant Pop. Share (Log Units)	-0.0016 (0.0087)	0.0022 (0.0067)	-0.0033 (0.0086)	0.0037 (0.0067)
Δ Child Depend. Ratio (Log Units)	0.0672 (0.0498)	0.0136 (0.0383)	0.0787 (0.0488)	0.0139 (0.0378)
Δ Aged Adult Depend. Ratio (Log Units)	-0.0390 (0.0310)	-0.0209 (0.0239)	-0.0426 (0.0305)	-0.0274 (0.0236)
Δ Married Share of Age 15-50 (Log Units)	-0.2446*** (0.0894)	-0.0497 (0.0687)	-0.2477*** (0.0870)	-0.0544 (0.0673)
Δ Minority Share (Log Units)	-0.0058 (0.0056)	-0.0044 (0.0043)	-0.0072 (0.0054)	-0.0060 (0.0042)
Male and Female Ind. Growth	Y	Y	Y	Y
Observations	291	291	282	282
R-squared	0.4025	0.3116	0.3724	0.3265
Test1:ABS=ABS	5.448		3.003	
p-value	0.0196		0.0831	
Test2:SR=SR	6.598		5.140	
p-value	0.0102		0.0234	

Standard errors calculated from seemingly unrelated regression model.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Notes: Standard errors calculated from seemingly unrelated regression model. "Test 1" tests for the equality of the Pred. Extent of Priv. estimate for the change in male and female employment outcomes. "Test 2" tests for the equality of the Pred. SR of Priv. for the male and female outcomes.

Table 7: Change in Male - Female Urban Employment by Age Group, SUR

Age Group: VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
	Age 20-29	Full Sample Age 30-39	Age 40-49	Age 20-29	Restricted Sample Age 30-39	Age 40-49
Pred. Extent of Priv.	0.0021 (0.0013)	0.0012 (0.0012)	0.0010 (0.0019)	0.0025 (0.0016)	0.0012 (0.0014)	0.0002 (0.0023)
Pred. SR of Priv.	-0.0805*** (0.0260)	-0.0659*** (0.0234)	-0.2138*** (0.0376)	-0.0446 (0.0277)	-0.0443* (0.0252)	-0.1961*** (0.0405)
Observations	291	291	291	282	282	282
R-squared	0.373	0.4199	0.4447	0.3988	0.4311	0.4239
Test1:Grp1 SR=Grp3 SR		10.17			10.72	
p-value		0.00143			0.00106	

Standard errors calculated from seemingly unrelated regression model.

*** p<0.01, ** p<0.05, * p<0.1

Notes: "Tests 1" tests for the equality of the Pred. SR of Priv. estimate for the Age 20-29 and Age 40-49 cohorts. All estimates include province fixed effects, prefecture controls, and male and female industry growth controls.

Table 8: Change in Male - Female Urban Employment by Age and Skill Group, SUR

Dep. Var. Age Group: VARIABLES	(1)		(2)		(3)	
	Change in Male - Female Urban Employment, 1990-2000					
	Age 20-29		Age 30-39		Age 40-49	
	Less than HS	HS Plus	Less than HS	HS Plus	Less than HS	HS Plus
<i>Panel A. Full Sample</i>						
Pred. Extent of Priv.	0.0017 (0.0020)	0.0011 (0.0051)	0.0022 (0.0017)	0.0057 (0.0104)	0.0035 (0.0022)	-0.0450 (0.0391)
Pred. SR of Priv.	-0.0838** (0.0393)	0.0661 (0.1013)	-0.0915*** (0.0342)	-0.1527 (0.2080)	-0.2532*** (0.0430)	-1.0726 (0.7798)
Observations	285	285	285	285	285	285
R-squared	0.3289	0.2791	0.3210	0.1814	0.4237	0.1504
Test1:ABS=ABS	0.0145		0.119		1.564	
p-value	0.904		0.730		0.211	
Test2:SR=SR	2.473		0.0912		1.118	
p-value	0.116		0.763		0.290	
<i>Panel B. Trimmed Sample</i>						
Pred. Extent of Priv.	0.0009 (0.0024)	0.0039 (0.0061)	0.0017 (0.0021)	0.0045 (0.0129)	-0.0001 (0.0025)	-0.0814* (0.0489)
Pred. SR of Priv.	-0.0625 (0.0428)	0.1774 (0.1084)	-0.0647* (0.0374)	-0.0321 (0.2311)	-0.2539*** (0.0454)	-1.0579 (0.8734)
Observations	276	276	276	276	276	276
R-squared	0.3461	0.2816	0.3165	0.1510	0.4146	0.1443
Test1:ABS=ABS	0.261		0.0511		2.791	
p-value	0.609		0.821		0.0948	
Test2:SR=SR	5.28		0.0211		0.857	
p-value	0.0216		0.885		0.355	

Standard errors calculated from seemingly unrelated regression model.

*** p<0.01, ** p<0.05, * p<0.1

Notes: "Tests 1" test for the equality of the Pred. Extent of Priv. estimates across the low and high educated groups within each age group. "Tests 2" test the equality of the Pred. SR of Priv. estimates for the two education groups within each age group. . All estimates include province fixed effects, prefecture controls, and male and female industry growth controls.

Table 9: Change in Male - Female Urban Employment, 1990-2005

Dep. Var. VARIABLES	(1)	(2)	(3)	(4)
	Δ Male - Female Urban Employment, 1990-2005			
Pred. Extent of Priv.	0.0003 (0.0021)	0.0011 (0.0021)	0.0006 (0.0021)	-0.0002 (0.0023)
Pred. Sex Ratio of Priv.†	-0.0166 (0.0252)	-0.0070 (0.0254)	-0.0334 (0.0248)	-0.0805** (0.0355)
Δ Avg. Years of Educ.		0.0098 (0.0118)	0.0099 (0.0163)	0.0072 (0.0155)
Δ Immigrant Pop. Share (Log Units)		0.0111 (0.0102)	0.0030 (0.0107)	0.0012 (0.0101)
Δ Child Depend. Ratio (Log Units)		0.0266 (0.0320)	0.0540 (0.0421)	0.0540 (0.0392)
Δ Aged Adult Depend. Ratio (Log Units)		-0.0086 (0.0242)	-0.0328 (0.0274)	-0.0393 (0.0276)
Δ Married Share of Age 15-50 (Log Units)		0.0821 (0.0867)	0.1217* (0.0641)	0.0960 (0.0674)
Δ Minority Share (Log Units)		-0.0048 (0.0054)	0.0019 (0.0057)	0.0017 (0.0052)
Pred. Male Industry Growth				0.5684* (0.3289)
Pred. Female Industry Growth				-0.2548* (0.1321)
Province FE	N	N	Y	Y
Observations	291	276	276	276
R-squared	0.0034	0.0203	0.3512	0.3697

Standard errors clustered by province.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

† Sex Ratio in units of Males per Female.

Notes: All regressions include province fixed effects. Predicted Industry Growth calculated for 1990-2000 period.

Table 10: Change in Male and Female Urban Employment, 1990-2005

Model Dep. Var. VARIABLES	(1) No Industry Growth		(3) With Industry Growth	
	d Male Emp.	d Female Emp.	d Male Emp.	d Female Emp.
Pred. Extent of Priv.	-0.0024*	-0.0030*	-0.0022	-0.0016
	(0.0014)	(0.0017)	(0.0014)	(0.0018)
Pred. SR of Priv.†	0.0152	0.0485**	0.0208	0.1142***
	(0.0155)	(0.0198)	(0.0161)	(0.0345)
Δ Avg. Years of Educ.	-0.0397***	-0.0496***	-0.0387***	-0.0439***
	(0.0099)	(0.0126)	(0.0099)	(0.0126)
Δ Immigrant Pop. Share (Log Units)	0.0124*	0.0094	0.0105	0.0060
	(0.0071)	(0.0090)	(0.0072)	(0.0090)
Δ Child Depend. Ratio (Log Units)	-0.0315	-0.0856**	-0.0319	-0.0864**
	(0.0325)	(0.0414)	(0.0325)	(0.0406)
Δ Aged Adult Depend. Ratio (Log Units)	-0.0494**	-0.0166	-0.0486**	-0.0077
	(0.0213)	(0.0272)	(0.0213)	(0.0269)
Δ Married Share of Age 15-50 (Log Units)	0.4589***	0.3372***	0.4441***	0.3242***
	(0.0661)	(0.0843)	(0.0670)	(0.0828)
Δ Minority Share (Log Units)	-0.0004	-0.0024	-0.0001	-0.0012
	(0.0044)	(0.0056)	(0.0044)	(0.0055)
Pred. Industry Growth (M or F)	N	N	Y	Y
Observations	276	276	276	276
R-squared	0.4237	0.4559	0.4195	0.4737
Test1:ABS=ABS	0.173	0.173	0.143	0.143
p-value	0.677	0.677	0.706	0.706
Test2:SR=SR	3.967	3.967	8.156	8.156
p-value	0.0464	0.0464	0.00429	0.00429

Standard errors clustered by province.

*** p<0.01, ** p<0.05, * p<0.1

† Sex Ratio in units of Males per Female.

Notes: All regressions include province fixed effects. Predicted Industry Growth calculated for 1990-2000 period.

Table 11: Re-employment Probabilities, CULS 2001

Model		1		2		3		4	
Dep. Var.: Work next period? (Yes = 1, No = 0)	Change in var.	Coeff.	% change, 1-yr re-emp. rate	Coeff.	% change, 1-yr re-emp. rate	Coeff.	% change, 1-yr re-emp. rate	Coeff.	% change, 1-yr re-emp. rate
Female	0 to 1	-0.239*** (0.0718)	-13%	-0.175 (0.111)	-9%	-0.200*** (0.0723)	-11%	-0.139 (0.116)	-3%
Years until Retirement*	4 to 5	–		0.0122*** (0.00430)	1%	–		0.00847* (0.00440)	0%
x Female	4 to 5	–		-0.00322 (0.00662)	0%	–		-0.00468 (0.00696)	0%
LTE6YTR	0 to 1	–		–		-0.651** (0.301)	-35%	-2.801*** (0.973)	-56%
x Female	0 to 1	–		–		0.246 (0.350)	14%	1.710 (1.076)	36%
x YTR	4 to 5	–		–		–		0.476*** (0.178)	10%
x YTR x Female	4 to 5	–		–		–		-0.300 (0.204)	-7%
Baseline one-year re-employment rate			33%		32%		35%		35%
Monthly Observations			49,879		49,879		49,879		49,879

Notes: (1) Cluster corrected robust standard errors at the neighborhood level are shown in parentheses.

(2) All models include dummy variables for one to six months unemployed, and a quartic in time unemployed for unemployment durations of seven months and longer.

(3) City and year fixed effects are included and significant in all models.

(4) Sample is limited to person-periods where the individual is currently non-employed, has been previously employed at least once since 1994, and whose age as of Dec 2001 was between 18 and the inferred retirement age.

(5) For each model, we show the coefficient from the logit regression, and use monthly marginal effects to calculate the percentage change in the annual baseline re-employment rate for the change in the variable listed in the left column.

(6) The predicted official retirement age is 50 for less than High School females, 55 for HS-educated and above females, and 60 for males.

(7) See Appendix Section A.6 for assumptions used to calculate marginal effects and the baseline hazard rate out of nonemployment.

Table 12: Wage Summary, 1990 and 2005

VARIABLES	(1) N	(2) mean	(3) sd	(4) min	(5) max
<i>Panel A. Year 1990†</i>					
Log Wage	204,169	-0.468	0.226	-1.332	0.0622
Log Male Wage	115,772	-0.408	0.219	-1.225	0.0622
Log Female Wage	88,397	-0.546	0.212	-1.332	-0.0456
Log Wage (Less than HS)	113,596	-0.481	0.227	-1.332	-0.0637
Log Male Wage (Less than HS)	64,355	-0.423	0.22	-1.225	-0.0637
Log Female Wage (Less than HS)	49,241	-0.557	0.214	-1.332	-0.17
Log Wage (HS and above)	90,573	-0.451	0.224	-1.173	0.0622
Log Male Wage (HS and above)	51,417	-0.39	0.217	-1.067	0.0622
Log Female Wage (HS and above)	39,156	-0.532	0.208	-1.173	-0.0456
<i>Panel B. Year 2005</i>					
Log Wage	202,833	1.624	0.695	-5.075	6.15
Log Male Wage	114,249	1.699	0.677	-3.332	6.081
Log Female Wage	88,584	1.527	0.706	-5.075	6.15
Log Wage (Less than HS)	66,451	1.271	0.636	-3.689	4.828
Log Male Wage (Less than HS)	38,013	1.389	0.625	-3.332	4.828
Log Female Wage (Less than HS)	28,438	1.115	0.617	-3.689	4.828
Log Wage (HS and above)	136,382	1.796	0.657	-5.075	6.15
Log Male Wage (HS and above)	76,236	1.854	0.648	-3.129	6.081
Log Female Wage (HS and above)	60,146	1.722	0.66	-5.075	6.15

† Year 1990 wages are imputed from the CHIP 1988, as described in the text.

Table 13: Change in Wages, 1990-2005

Analysis Dep. Var.: Change in Wage, 1990-2005 Subpopulation	(1)	(2)	(3)	(4)	(5)	(6)
	OLS	SUR By Skill		SUR By Age Cohort		
	All	Low Skill	High Skill	Age 20- 29	Age 30- 39	Age 40- 49
VARIABLES						
<i>Panel A. Base Model</i>						
Pred. Extent of Priv.	-0.0010 (0.0042)	-0.0006 (0.0031)	-0.0018 (0.0035)	0.0053 (0.0037)	-0.0022 (0.0039)	-0.0037 (0.0036)
Pred. SR of Priv. †	-0.0050 (0.0497)	0.0188 (0.0352)	0.0020 (0.0393)	0.0130 (0.0415)	-0.0096 (0.0439)	0.0197 (0.0412)
Observations	276	275	275	275	275	275
R-squared	0.6127	0.5887	0.6480	0.6350	0.5974	0.5759
<i>Panel B. With Industry Growth Controls</i>						
Pred. Extent of Priv.	0.0015 -0.0043	-0.0000 (0.0034)	0.0010 (0.0037)	0.0073* (0.0040)	0.0015 (0.0042)	-0.0009 (0.0039)
Pred. SR of Priv.	0.1139 (0.0949)	0.0477 (0.0709)	0.1429* (0.0784)	0.1013 (0.0833)	0.1719** (0.0875)	0.1627** (0.0823)
Pred. Male Industry Growth	-0.4321 (0.7178)	-0.1302 (0.4661)	-0.6569 (0.5156)	0.1233 (0.5482)	-0.4830 (0.5753)	-0.8148 (0.5412)
Pred. Female Industry Growth	0.5383 (0.3386)	0.1335 (0.2686)	0.6530** (0.2972)	0.3531 (0.3159)	0.8035** (0.3316)	0.6779** (0.3119)
Observations	276	275	275	275	275	275
R-squared	0.6173	0.5891	0.6544	0.6373	0.6058	0.5840

Standard errors clustered by province.

*** p<0.01, ** p<0.05, * p<0.1

† Sex Ratio in units of Males per Female.

Notes: All estimates include controls and province fixed effects. Industry Growth controls use the 1990-2000 period. OLS analysis clusters standard errors at the province level.

Table 14: Change in Wages, by Gender, 1990-2005

Analysis Subpopulation VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
	All (OLS)	By Skill (SUR)		By Age Cohort (SUR)		
		Low Skill	High Skill	Age 20-29	Age 30-39	Age 40-49
<i>Panel A. Change in Male Wages</i>						
Pred. Extent of Priv.	-0.0011 (0.0041)	-0.0005 (0.0032)	-0.0019 (0.0036)	0.0049 (0.0040)	-0.0017 (0.0039)	-0.0037 (0.0037)
Pred. SR of Priv.	0.0082 (0.0534)	0.0488 (0.0381)	0.0015 (0.0427)	0.0415 (0.0472)	0.0029 (0.0460)	0.0095 (0.0441)
Pred. Male Industry Growth	-0.3543 (0.6875)	-0.2093 (0.4498)	-0.5151 (0.5041)	-0.1333 (0.5564)	0.0286 (0.5425)	-0.7378 (0.5203)
Observations	276	275	275	272	272	272
R-squared	0.6393	0.6315	0.6440	0.6142	0.6399	0.6083
<i>Panel B. Change in Female Wages</i>						
Pred. Extent of Priv.	0.0023 (0.0043)	0.0026 (0.0038)	0.0006 (0.0037)	0.0074* (0.0043)	0.0029 (0.0045)	-0.0014 (0.0044)
Pred. SR of Priv.	0.1477 (0.0922)	0.0721 (0.0792)	0.1634** (0.0787)	0.0480 (0.0908)	0.2367** (0.0940)	0.1633* (0.0918)
Pred. Female Industry Growth	0.8298** (0.3289)	0.5458* (0.3001)	0.8390*** (0.2982)	0.2501 (0.3442)	1.2045*** (0.3562)	0.7777** (0.3478)
Observations	276	268	268	267	267	267
R-squared	0.5880	0.5109	0.6536	0.6042	0.5589	0.5253

Standard errors clustered by province.

*** p<0.01, ** p<0.05, * p<0.1

† Sex Ratio in units of Males per Female.

Notes: All estimates include controls and province fixed effects. Industry Growth controls use the 1990-2000 period. OLS analysis clusters standard errors at the province level.

Table 15: Change in Male - Female Wage Gap, 1990-2005

Analysis	(1)	(2)	(3)	(4)	(5)	(6)
Dep. Var.: Δ M - F Wage Gap, 1990-2005	OLS	SUR		SUR		
Subpopulation	All	By Skill		By Age Cohort		
VARIABLES		Low Skill	High Skill	Age 20-29	Age 30-39	Age 40-49
<i>Panel A. No Industry Growth Controls</i>						
Pred. Extent of Priv.	0.0009 (0.0019)	-0.0005 (0.0026)	0.0018 (0.0017)	-0.0003 (0.0030)	0.0008 (0.0020)	0.0020 (0.0026)
Pred. SR of Priv. †	0.0565** (0.0220)	0.1029*** (0.0299)	0.0370* (0.0197)	0.0734** (0.0341)	0.0324 (0.0231)	0.0380 (0.0290)
Observations	276	268	268	267	267	267
R-squared	0.4019	0.2903	0.1780	0.2158	0.4402	0.3561
<i>Panel B. With Industry Growth Controls</i>						
Pred. Extent of Priv.	-0.0008 (0.0014)	-0.0027 (0.0028)	0.0007 (0.0019)	0.0001 (0.0033)	-0.0014 (0.0022)	0.0015 (0.0028)
Pred. SR of Priv. †	-0.0209 (0.0392)	0.0006 (0.0591)	-0.0152 (0.0389)	0.0936 (0.0677)	-0.0684 (0.0453)	0.0132 (0.0576)
Pred. Female Industry Growth	-0.3211** (0.1442)	-0.4241** (0.2116)	-0.2164 (0.1395)	0.0836 (0.2424)	-0.4178** (0.1625)	-0.1032 (0.2065)
Observations	276	268	268	267	267	267
R-squared	0.4145	0.3008	0.1853	0.2161	0.4538	0.3567
Standard errors clustered by province.						
*** p<0.01, ** p<0.05, * p<0.1						

† Sex Ratio in units of Males per Female.

Notes: All estimates include controls and province fixed effects. Industry Growth controls use the 1990-2000 period. OLS analysis clusters standard errors at the province level.

A Appendix

A.1 Gender-specific Industry Growth Controls

Our measures for industry growth are as follows

$$\begin{aligned}
 \widehat{INDGROW}_{gk} &= \widehat{GROW}_{gi} + \widehat{TECH}_{gi}, \text{ where} \\
 \widehat{GROW}_{gi} &= f_{g|0i}(\widehat{INDGROW}_i) \\
 &= f_{g|0i} * \sum_j f_{j|0i} \left(\widehat{INDGROW}_j \right) \\
 &= f_{g|0i} * \sum_j f_{j|0i} \left(\frac{E_{1j} - E_{0j}}{E_{0j}} \right) \\
 \widehat{TECH}_{gi} &= \sum_j \frac{f_{g|1j} - f_{g|0j}}{f_{g|0j}} * f_{j|i0}
 \end{aligned}$$

where g indexes gender, i indexes locality, j indexes industry, and 0 and 1 represent the beginning period and end period, respectively.

Gender-specific industry growth is decomposed into two components, a gender-neutral growth component, \widehat{GROW}_{gi} , and a gender-specific shift component, \widehat{TECH}_{gi} . The gender-neutral growth component is the projected industry growth in locality i interacted with its initial share of gender g . The projected industry growth is the weighted average of national industry growth rates, with the weights determined by the industrial composition of locality i in the initial period. The gender-specific shift component is the weighted average of the national gender-specific growth rates for industry j interacted, with the weights determined by the industrial composition of locality i in the initial period.

A.2 Social Welfare Programs During Urban Enterprise Reform

This description of social welfare programs for displaced workers relies heavily on Giles et al. (2006b).

One policy supported officially laid off, or *xiagang*, workers. This policy, intended for permanent workers or for contract workers whose jobs ended before their contracts expired, provided 3 years of basic living subsidies at 60% of the worker's final wage in addition to health insurance and pension contributions. As Giles et al. (2006b) note, benefits often declined over time and subsidies were intended to be greater than unemployment insurance subsidies. In practice, benefit amounts depended on the financial resources of them municipality. These laid-off workers retained formal ties to their former work units until they found a new job but are expected to register with newly established re-employment centers designed to provide skill training and assistance in finding new jobs. These *xiagang* subsidies were funded by the unemployment insurance funds in addition to central and local budgetary

expenditures and enterprise contributions. While these benefits were supposed to end at the beginning of 2001, in practice, benefits were maintained beyond then.

Another effort was an unemployment insurance program that began in 1999. This program was designed to provide coverage to all workers regardless of whether they were employed in the state, collective, or other/private sector. This program is financed by payroll charges and provides subsidies for up to two years depending on how long the worker and the employer participated in the unemployment insurance program. Workers whose 3 years of *xiagang* subsidies expire become immediately eligible for unemployment benefits. Hence, theoretically, workers who were laid off from the state sector could have had access to 5 years of public subsidies while unemployed.

Another source of public help for displaced workers is early pension payments provided to individuals who are pressured to retire before reaching official retirement age. The amounts of such payments are negotiated between workers and employers, and are typically less than regular pension payments. In principle, nothing prohibits such workers from re-entering the workforce.

Around 1998, many cities also provided help through a minimum living standard program (MLSP) that targeted households whose income per capita fell below a designated urban poverty line set by each city.

A.3 Re-employment services

Concerned about the welfare of laid-off workers, local governments introduced several different types of program to support displaced workers, with varying coverage and effectiveness. A re-employment program was introduced to assist laid-off workers, also called *xiagang* workers, in 1998. This policy, intended for permanent workers or for contract workers whose jobs ended before their contracts expired, provided 3 years of basic living subsidies at 60% of the worker's final wage in addition to health insurance and pension contributions. As Giles et al. (2006b) note, benefits often declined over time and subsidies were intended to be greater than unemployment insurance subsidies. In practice, benefit amounts depended on the financial resources of them municipality. These laid-off workers retained formal ties to their former work units until they found a new job but are expected to register with newly established re-employment centers designed to provide skill training and assistance in finding new jobs. These *xiagang* subsidies were funded by the unemployment insurance funds in addition to central and local budgetary expenditures and enterprise contributions. While these benefits were supposed to end at the beginning of 2001, in practice, benefits were maintained beyond then.

In addition to *xiagang* subsidies, the government standardized an unemployment insurance program in 1999. It is financed by payroll charges and provides subsidies for up to two years depending on how long the worker and/or the work unit has participated in the program. Workers whose three years of *xiagang* subsidies expired become immediately eligible for unemployment benefits.

By around 1998, most cities also began providing income through the minimum living standard program (MLSP), run by the Ministry of Civil Affairs. This program provided subsidies to households whose income per capita fell below designated urban poverty lines. However, Giles et al. (2006a) note that this program was administered in an ad hoc fashion

that lacked standardized poverty thresholds, funding support, and administrative apparatus or supervision.

The Chinese government also passed regulations mandating that employers who lay off large numbers of employees must establish re-employment centers to provide skill training and job referral services for workers. Technically, these regulations require that workers receive *xiagang* subsidies, discussed above, to use these services. However, in reality, in the CULS 2001 data, only 12% of the *xiagang* workers were requested to participate in any training activities, and many of these did not even bother attending the sessions.

In practice these employment referral centers were provided by the local residents' committee (RC), which is a neighborhood organization established and governed by the municipal government. AS of 2001, the time of the CULS survey, the Ministry of Civil Affairs was in the process of strengthening and professionalizing RCs. Employment referral services were provided by the RC in 226 of the 356 communities surveyed in the CULS 2001. The referral service usually consists of a list of local employers, e.g. restaurants, shops, enterprises, private housing developments, and households, that have contacted the RC and expressed interest in hiring workers.

A.4 Data Description

A.4.1 Imputing 1990 Wages

The wages imputed for the 1990 Census are based on predictions from a wage regression using the 1988 China Household Income Project (CHIP).

The following variables are used to estimate the wage regression in the CHIP 1988 data: a female indicator, age, age squared, a currently married indicator, indicators for 4 levels of educational attainment, industry category, educational attainment (4 categories).... The sample used includes only those who are of Han ethnicity, considered employees, possessing urban hukou, and employed in a non-agricultural industry. We note that the industry categories in the CHIP 1988 data are much more aggregated than those found in the 1990 and 2000 Census.

The estimates are then used to predict wages in the 1990 Census for a sample of those aged 18-50 years, employed in a non-agricultural sector, possessing urban hukou, and Han ethnicity.

A.4.2 Re-Weighting the 2005 Mini-Census data

The 1990-2005 analysis of employment and wage outcomes used a re-weighting of the sample from the 2005 China Population Mini-Census because of concerns of sampling bias raised in Jenq (2015). The procedure was a logistic regression to generate "post-stratification" weights using the 2000 Census as a reference dataset.

A logit regression was run on a dataset with the 2005 data appended to the 2000 data. The dependent variable set to 1 for the 2005 data and 0 for the 2000 data. The independent variables in the regression were the variables associated with the triple interaction of the female indicator, 4 categories of educational attainment, and source province, along with the interaction of the female indicator with indicators for different 5 year birth cohorts. Predic-

tions for the probability of each observation appearing in the 2005 sample were generated. The new weight is the reciprocal of this predicted sample probability.

A.4.3 China Urban Labor Survey (CULS)

The first wave of the CULS was conducted in the end of 2001 by the Institute for Population and Labour Economics at the Chinese Academy of Social Sciences in collaboration with provincial and municipal offices of the National Bureau of Statistics.

The five cities involved in the survey were Fuzhou, Shanghai, Shenyang, Wuhan, and Xi'an. Within each city, a proportional population sampling approach was used to sample an average of 15 registered urban households in each of 70 neighborhood clusters. All family members above age 16 were interviewed. This surveys included approximately 3500 households and 8109 adults.

The sample includes only individuals living in households with local urban permanent residence permits.

The CULS includes individual calendar-based work histories with detailed questions about job changes, transitions to unemployment or retirement, changes in pension, health care, and housing benefits, and access to government programs since January 1996. It also includes detailed contemporaneous information on work status, income, expenditure, housing and consumer durables, productive assets and wealth, health, and household demographics.

A.5 CULS Specification

This specification estimates the relative importance of different variables in predicting the hazard probabilities of exiting non-employment. The transition probability or hazard rate, denoted $\lambda(t, \mathbf{Z})$, is the probability of leaving a state in period t conditional on both a continuation in this state for the previous $t - 1$ periods and a set of covariates, denoted Z . In the most general form, the covariate vector varies by individual i , neighborhood j , in city k , at time t . The hazard rate $\lambda(t, \mathbf{Z})$ is modeled as a logit function so that we have

$$\lambda(t, \mathbf{Z}) = \frac{\exp(\alpha_t + Z_{ijkt}\Pi)}{1 + \exp(\alpha_t + Z_{ijkt}\Pi)} \quad (8)$$

The logit specification allows for time-varying covariates and a flexible form for the effect of time on the likelihood of re-employment in the next period. It does not place any parametric assumptions on the functional form of the hazard.

The vector α_t consists of indicator variables for the length of non-working spells for each of the first 6 months after separation and a quartic term ($t + t^2 + t^3 + t^4$) for each month from 7 to 96 after job separation. The combined time dummies and quartic terms provide a non-parametric control for the duration properties of the model. Exit probabilities are scaled up or down by time-varying covariates Z_{ijkt} . The specification of Z_{ijkt} is

$$Z_{ijkt}\Pi = X_{ijkt}\gamma_1 + B'_{ijkt}\gamma_2 + \mathbf{city}_k + \mathbf{year}_t \quad (9)$$

where X_{ijkt} is a vector of individual worker characteristics and other controls for factors affecting the demand for and supply of labor. It includes years of education, contemporaneous

age, the sector of the last job, provincial level labor market measures, and household structure variables that include presence of resident children of various age ranges, along with the presence of retirees below and above age 65, and the presence of adult children in the same city. The vector B'_{ijkt} contains variable capturing the benefits of non-employment, such as access to public subsidies, receipt of an early retirement pension, and xiagang (laid-off) status. Neighborhood-level variables are also included, such as the non-working share of working-age adults, the log mean household consumption per capita, the average years of education of working-age adults, the log number of households in the neighborhood, and the share of households in privately-owned housing.

A.6 Calculating Marginal Effects and Baseline Employment Rates

To develop a better interpretation of the economic magnitude of the logit regression estimates, we calculate the effect of changes in variables on one year baseline re-employment rates. The baseline re-employment rates are generated by calculating a baseline monthly hazard rate using an assumed base set of values for all variables, and then converting to an annualized rate. Then the 12-month marginal effect of a specific change in variables is calculated. This annualized marginal effect is then divided by the baseline re-employment rate.

The baseline hazard assumptions are as follows: Years of education=12; Age=40; Household size=3; Married=1; Children under 6=0; Children between 6 and 12=0; Children between 12 and 18 = 0; Mandatory retirees under 65 = 0; Resident over 65=0; Xiagang = 0; Registered unemployed = 0; Early retired = 0; Last job in state sector, collective, private, or foreign sector all set to 0; change in provincial SOE employment in industry sector of prior job = 0; change in log of provincial employment in industry with other ownership types = 0.

B Appendix Tables

Table B.1: Industry Characteristics: Privatization, Sex Ratio, etc.

Industry Name	% NA Emp.	1990 SR	SOE Emp. Share		Rel. Priv.*
			1995*	2004*	
Goods (Tradeables) Industries	53.9%	130			
Garments, Fiber Prod.	2.8%	38	6	3	50%
Textile Industry	6.9%	66	44.8	12	73%
Stationery, Educ., Sports Goods	1.8%	66	8.3	2	76%
Leathers, Furs, Down, etc.	1.0%	69	10	1	90%
Printing and Record Pressing	0.8%	75	40.1	15	63%
Plastic Products	1.1%	82	10	4	60%
Rubber Products	1.1%	93	33.4	12	64%
Tobacco Processing	0.2%	96	79.8	92	-15%
Electric Equip., Machinery	2.0%	97	28.6	9	69%
Medical and Pharma Products	0.5%	100	58	27	53%
Chemical Fibers	0.3%	114	46.8	31	34%
Elec. and Telecom Equipment	2.0%	118	38.3	12	69%
Timber, bamboo, cane, etc.	0.8%	119	16.6	7	58%
Papermaking and Paper Products	1.5%	128	29.1	10	66%
Food Processing	0.9%	130	44.5	10	78%
Beverage Manufacturing	0.8%	131	51.6	22	57%
Food Manufacturing	2.7%	135	42	10	76%
Metal Products	1.5%	141	14	6	57%
Non-metal Mineral Products	5.1%	152	21.2	9	58%
Tap Water Production and Supply	0.2%	154	86.1	74	14%
Ordinary Machinery Manufacturing	3.6%	162	39.1	17	57%
Raw Chemical Materials & Prod.	2.4%	163	56.5	26	54%
Petroleum Processing and Coking Products	0.3%	169	64.4	45	30%
Furniture Manufacturing	1.2%	176	6.4	2	69%
Special Purpose Equipment	1.2%	179	54.4	27	50%
Transport Equipment	2.3%	187	54.8	36	34%
Gas Production and Supply	0.1%	195	94.1	75	20%
Smelt/Press Non-Ferrous Metals	0.3%	200	57	40	30%
Non-Ferrous Metals Mining	0.6%	212	56.5	35	38%
Smelt/Press of Ferrous Metals	1.1%	233	62.9	47	25%
Non-Metal Minerals Mining	1.1%	236	22.4	15	33%
Elec. Power, Steam, Hot Water	1.2%	241	83.5	80	4%
Petroleum, Natural Gas Extract	0.4%	272	98.6	96	3%
Ferrous Metals Mining & Proc.	0.2%	329	35.2	23	35%
Coal Mining and Processing	3.8%	382	65.2	59	10%

Sources: U.S. Bureau of Economic Analysis, (GDP) by Industry Data; China Industrial Census 1995; China Economic Census 2004; Holz (2013)

Notes: * Capital Intensity is the share of value added not from employee wages. ** The absolute extent of privatization is the difference between the 1995 state-owned employment share and the 2004 state-owned employment share. The relative extent is the extent of privatization relative to the original state ownership share in 1995.

Table B.2: Variable Summary, CULS 2001 Sample

VARIABLES	(1) N	(2) Mean	(3) SD	(4) Min	(5) Max
<i>Individual Level Sample</i>					
Years of Education	7,530	11.04	3.448	1	22
Age	7,530	46.85	14.35	16	91
Household Size	7,530	3.155	1.044	1	9
Currently Married	7,530	0.839	0.368	0	1
Years until Retirement	7,530	7.254	9.021	-11	29
<i>Nonemployed Sample</i>					
Duration of non-employment spell	108,598	27.62	21.41	1	96
Xiagan (Laid-off) Status	108,598	0.161	0.367	0	1
Registered Unemployment Status	108,598	0.0330	0.179	0	1
Early Retirement Status	108,598	0.127	0.333	0	1
Previous job in:					
Collective Sector	108,598	0.0888	0.284	0	1
Government Sector	108,598	0.646	0.478	0	1
Domestic Private	108,598	0.148	0.355	0	1
Foreign Sector	108,598	0.0470	0.212	0	1
Other	108,598	0.0699	0.255	0	1
Eligibility for Public Subsidies*	108,598	0.182	0.386	0	1
Received Early Retirement Pension	108,598	0.0487	0.215	0	1
Change in Province's State Emp.**	108,598	-0.0993	0.0888	-0.444	0.113
Change in Province's Non-state Emp.**	108,598	0.0115	0.170	-0.444	1.240
<i>Neighborhood Level Sample</i>					
Share of working age nonemployed	34	0.491	0.0717	0.292	0.680
Mean Household Nondurable Consumption	34	6,306	1,838	3,148	10,843
Average Years of Education (Working Age)	34	10.97	0.682	9.750	12.72
Share of Housing Privately Owned	34	0.628	0.132	0.359	0.908
Number of Households	34	102.6	45.17	10	158
<i>Household Structure***</i>					
Presence of Resident Children, Age 0-5	5,957	0.0567	0.231	0	1
Presence of Resident Children, Age 6-11	5,957	0.0502	0.218	0	1
Presence of Resident Children, Age 12-18	5,957	0.105	0.307	0	1
Presence of Resident Retirees, Under 65 Yrs	5,957	0.125	0.330	0	1
Presence of Resident Retirees, 65 Yrs Plus	5,957	0.0562	0.230	0	1
Presence of Adult Children‡, Age 18-22	5,957	0.0529	0.224	0	1
Presence of Adult Children‡, Age 23-27	5,957	0.0999	0.300	0	1
Presence of Adult Children‡, Age 28 and older	5,957	0.272	0.445	0	1

*=1 if individual is Registered Unemployed or Laidoff/Xiagan. ** Employment in same industry.

*** As of first month of non-employment, ‡ In the same City,

Notes: Individual sample consists of individuals as of June 2001. Nonemployed sample consists of person-month observations of nonemployment. Neighborhood level sample is aggregated as of June 2001. Resident retirees are those above the official retirement age, which differ by gender and education. All males are imputed a retirement age of 60, while females with less than a high school or equivalent education are imputed a retirement age of 50. Females with a high school or greater education are imputed a retirement age of 55.

Table B.3: Re-employment Probabilities, Control Variables, CULS 2001

Model		1		2		3		4	
Dep. Var.: Work next pe- riod? (Yes = 1, No = 0)	Change in var.	Coeff.	% change, 1-yr re-emp. rate	Coeff.	% change, 1-yr re-emp. rate	Coeff.	% change, 1-yr re-emp. rate	Coeff.	% change, 1-yr re-emp. rate
Yrs. of Educ.	12 to 13	0.0126 (0.0133)	1%	0.0138 (0.0126)	1%	0.0124 (0.0136)	1%	0.0142 (0.0130)	0%
Current Age	40 to 41	- 0.0260*** (0.00452)	-1%	- 0.0284*** (0.00461)	-1%	-0.0186*** (0.00478)	-1%	-0.0197*** (0.00479)	0%
Household Size	3 to 4	0.0141 (0.0422)	1%	0.0265 (0.0425)	1%	0.0246 (0.0424)	1%	0.0304 (0.0428)	1%
Married	0 to 1	0.257** (0.119)	10%	0.206* (0.122)	9%	0.201* (0.119)	10%	0.165 (0.122)	3%
Xiagang	0 to 1	-0.00459 (0.290)	0%	-0.00799 (0.288)	0%	-0.0165 (0.293)	-1%	-0.00517 (0.291)	0%
Reg. Unemp.	0 to 1	-0.180 (0.275)	-9%	-0.188 (0.272)	-10%	-0.192 (0.279)	-11%	-0.198 (0.278)	-4%
Retired Early	0 to 1	-0.479** (0.211)	-24%	-0.447** (0.212)	-23%	-0.433** (0.214)	-25%	-0.432** (0.215)	-10%
Last job, Collective Sector	0 to 1	-0.389** (0.163)	-19%	-0.400** (0.164)	-19%	-0.400** (0.162)	-18%	-0.404** (0.160)	-17%
Last job, State Sector	0 to 1	-0.416*** (0.157)	-20%	-0.423*** (0.157)	-20%	-0.407*** (0.153)	-18%	-0.409*** (0.152)	-18%
Baseline one-year re- employment rate			33%		32%		35%		35%
Monthly Observations			49,879		49,879		49,879		49,879

Continued on next page

Table B.3 – continued from previous page

Model		1		2		3		4	
Dep. Var.:	Change in var.	Coeff.	% change, 1-yr re-emp. rate	Coeff.	% change, 1-yr re-emp. rate	Coeff.	% change, 1-yr re-emp. rate	Coeff.	% change, 1-yr re-emp. rate
Last job, Private Sector	0 to 1	0.102 (0.155)	5%	0.0904 (0.156)	4%	0.104 (0.152)	5%	0.0986 (0.152)	4%
Last job, Foreign-invested ent.	0 to 1	-0.111 (0.223)	-5%	-0.119 (0.223)	-6%	-0.109 (0.220)	-5%	-0.117 (0.219)	-5%
$\Delta \text{Ln}(\text{Emp., state sector})$	0 to -0.05	2.729*** (0.478)	9%	2.769*** (0.472)	9%	2.731*** (0.472)	10%	2.762*** (0.472)	4%
$\Delta \text{Ln}(\text{Emp., non-state sector})$	0 to -0.05	-0.743*** (0.230)	-2%	-0.736*** (0.226)	-2%	-0.728*** (0.230)	-2%	-0.718*** (0.227)	-1%
<i>Neighborhood variables</i>									
Non-Working %, working-age adults	0.50 to 0.55 (10% increase)	0.00934 (0.912)	0%	0.0299 (0.872)	2%	-0.0165 (0.905)	-1%	0.00636 (0.874)	0%
Ln (Mean HH cons. per capita)	8.71 to 9.58 (10% increase)	-0.0158 (0.239)	-1%	-0.0137 (0.233)	-1%	0.00325 (0.234)	0%	0.000628 (0.227)	0%
Baseline one-year re-employment rate		33%		32%		35%		35%	
Monthly Observations		49,879		49,879		49,879		49,879	

Continued on next page

Table B.3 – continued from previous page

Model		1		2		3		4	
Dep. Var.: Work next period? (Yes = 1, No = 0)	Change in var.	Coeff.	% change, 1-yr re-emp. rate	Coeff.	% change, 1-yr re-emp. rate	Coeff.	% change, 1-yr re-emp. rate	Coeff.	% change, 1-yr re-emp. rate
Avg. Yrs. Educ, working-Age adults	11.0 to 12.10 (10% increase)	0.134 (0.0974)	6%	0.131 (0.0963)	6%	0.130 (0.0959)	7%	0.131 (0.0945)	3%
Ln (# of households)	4.43 to 4.87	-0.0222 (0.0887)	-1%	-0.0217 (0.0881)	-1%	-0.0246 (0.0887)	-1%	-0.0276 (0.0878)	-1%
% HH, privately-owned housing	0.63 to 0.69 (10% increase)	0.0650 (0.167)	3%	0.0485 (0.169)	2%	0.0691 (0.168)	4%	0.0598 (0.171)	1%
Early Retirement Pension	0 to 1	0.132 (0.314)	6%	0.137 (0.314)	7%	0.135 (0.311)	7%	0.137 (0.308)	3%
Access to public subsidies	0 to 1	0.0758 (0.320)	4%	0.0478 (0.314)	2%	0.0425 (0.319)	2%	0.00341 (0.314)	0%
Resident children under 6	0 to 1	0.157 (0.0992)	7%	0.0869 (0.109)	4%	0.149 (0.0963)	8%	0.114 (0.107)	2%
Resident children from 6 to 12	0 to 1	-0.240** (0.0943)	-12%	-0.336*** (0.0993)	-17%	-0.286*** (0.0950)	-16%	-0.333*** (0.0972)	-8%
Baseline one-year re-employment rate		33%		32%		35%		35%	
Monthly Observations		49,879		49,879		49,879		49,879	

Continued on next page

Table B.3 – continued from previous page

Model		1		2		3		4	
Dep. Var.: Work next pe- riod? (Yes = 1, No = 0)	Change in var.	Coeff.	% change, 1-yr re-emp. rate	Coeff.	% change, 1-yr re-emp. rate	Coeff.	% change, 1-yr re-emp. rate	Coeff.	% change, 1-yr re-emp. rate
Resident children from 12 to 18	0 to 1	-0.121*	-6%	-0.141**	-7%	-0.151**	-9%	-0.169**	-4%
		(0.0678)		(0.0685)		(0.0694)		(0.0707)	
Retirees over retirement age, < 65 yrs.	0 to 1	-0.00452	0%	-0.0272	-1%	-0.00431	0%	-0.0129	0%
		(0.0685)		(0.0668)		(0.0689)		(0.0669)	
Retirees 65 yrs or older	0 to 1	-0.0938	-5%	-0.111	-6%	-0.107	-6%	-0.119	-3%
		(0.0767)		(0.0771)		(0.0748)		(0.0755)	
Presence of Adult Child* (18 < Age < 23)	0 to 1	-0.224	-11%	-0.187	-9%	-0.238	-13%	-0.214	-5%
		(0.314)		(0.312)		(0.322)		(0.322)	
Presence of Adult Child* (23 < Age < 27)	0 to 1	-0.322	-16%	-0.263	-13%	-0.214	-12%	-0.176	-4%
		(0.335)		(0.331)		(0.322)		(0.319)	
Presence of Adult Chil- dren* (Age 28+ Years)	0 to 1	-0.474	-23%	-0.387	-19%	-0.247	-14%	-0.00996	0%
		(0.432)		(0.425)		(0.396)		(0.394)	
Baseline one-year re- employment rate			33%		32%		35%		35%
Monthly Observations			49,879		49,879		49,879		49,879

Continued on next page

Table B.3 – continued from previous page

Model		1		2		3		4	
Dep. Var.:	Change	Coeff.	%	Coeff.	%	Coeff.	%	Coeff.	%
Work next pe-	in var.		change,		change,		change,		change,
riod? (Yes = 1, No = 0)			1-yr		1-yr		1-yr		1-yr
			re-emp.		re-emp.		re-emp.		re-emp.
			rate		rate		rate		rate
Baseline	one-year re-employment rate		33%		32%		35%		35%
Monthly Observations			49,879		49,879		49,879		49,879

* *Presence of Adult Child in the Same City*

Notes: (1) Cluster corrected robust standard errors at the neighborhood level are shown in parentheses.

(2) All models include dummy variables for one to six months unemployed, and a quartic in time unemployed for unemployment durations of seven months and longer.

(3) City and year fixed effects are included and significant in all models.

(4) Sample is limited to person-periods where the individual is currently non-employed, has been previously employed at least once since 1994, and whose age as of Dec 2001 was between 18 and the inferred retirement age.

(5) For each model, we show the coefficient from the logit regression, and use monthly marginal effects to calculate the percentage change in the annual baseline re-employment rate for the change in the variable listed in the left column.

(6) The predicted official retirement age is 50 for less than High School females, 55 for HS-educated and above females, and 60 for males.

(7) See Appendix ?? for assumptions used to calculate marginal effects and the baseline hazard rate out of nonemployment.

Table B.4: Variable Summary, 1990-2005

VARIABLES	Units	(1) N	(2) Wtd. Mean	(3) SD	(4) Min	(5) Max
Δ Male - Female Employment	Fraction	276	0.075	0.0911	-0.245	0.275
Δ Log Wage	Log Units	276	1.95	0.236	1.428	3.481
Δ Log (Male/Female) Wage	Log Units	276	0.068	0.121	-0.477	0.635
Δ Log Male Wage	Log Units	276	1.97	0.245	1.408	3.502
Δ Log Female Wage	Log Units	276	1.90	0.245	1.386	3.434
Pred. Extent of Privatization	Perc. Points	276	9.745	7.270	0.0205	88.01
Pred. Sex Ratio of Privatization	Males / Females	276	1.330	0.356	0.394	3.216
Pred. Male Industry Growth, 1990-2000	Fraction	276	0.008	0.0262	-0.137	0.0530
Pred. Female Industry Growth, 1990-2000	Fraction	276	-0.124	0.0858	-0.465	0.0736
Δ Average Years of Education	Years	276	-0.08	0.617	-1.935	1.748
Δ Migrant Share of Population	Fraction	276	3.58	3.231	0.294	29.00
Δ Child Dependency Ratio	Fraction	276	0.70	0.198	0.255	1.727
Δ Adult Dependency Ratio	Fraction	276	1.56	0.587	0.203	6.330
Δ Married Share of Population	Fraction	276	1.08	0.0937	0.900	1.411
Δ Minority Share of Population	Fraction	276	3.27	10.42	0.00305	124.9

Notes: The Child Dependency Ratio is the ratio of the age 0-14 population to the age 15-64 population. The Adult Dependency Ratio is the ratio of the age 65 and over population to the age 15-64 population. Regression analysis uses logged values of the following variables: Change in Migrant Share, Change in Child Dependency Ratio, Change in Adult Dependency Ratio, Change in the Married Share of the Population, and Change in the Minority Share of the population.

C Appendix Figures

Figure C.1: Prefectural City Schema

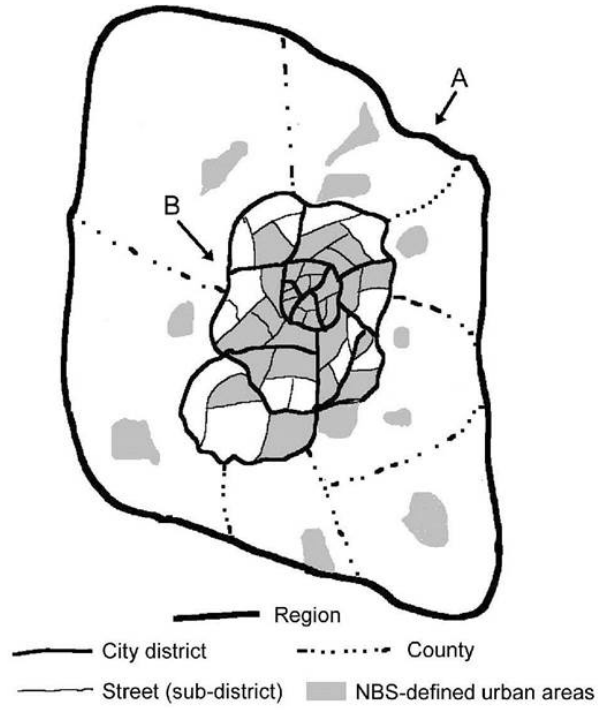


Fig. 1. Conceptual diagram of the spatial/administrative structure of a typical large city in China.

Figure C.2: Pred. Extent of Privatization vs. Pred. SR of Privatization

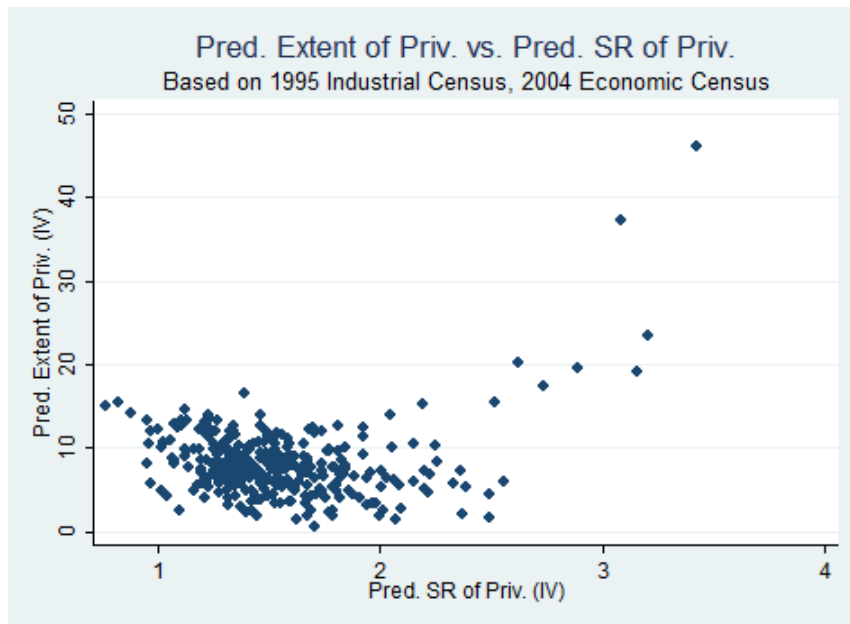


Figure C.3: Change in Gender Gap and Pred. Sex Ratio of Privatization

