Gendered Impacts of Privatization: A Life Cycle Perspective from China*

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Abstract

Women at different life stages may respond differently to economic shocks as they face varying trade-offs. This paper explores the role of public sector employment, characterized by gender-equal wage setting and family-friendly childcare policies, in shaping the gender gap over the life cycle. We focus on the privatization of the state sector in urban China in the late 1990s, which introduced competition and caused massive layoffs. Using cross-prefecture variation in reform exposure, based on initial differences in state-owned enterprise employment shares, we employ a difference-in-differences design. We show that older women were more likely to be laid off and faced greater difficulty in finding reemployment than men. Middle-aged women were less likely than men to transition to the emerging private sector, while younger women prioritized human capital investment more than men and delayed marriage. Further mechanism analysis reveals that privatization increased the demand for high-skilled workers, reshaped household specialization, intensified childcare burdens on women, and reinforced traditional gender-role attitudes.

Keywords: SOE Reform, Labor Market Outcomes, Gender Gap, Life Cycle

JEL Codes: I20, J12, J16, P20

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1 Introduction

Women face changing trade-offs throughout life stages, balancing education and marriage in youth and later managing work-family dynamics (Goldin, 2006, 2014; Goldin and Mitchell, 2017). This paper explores how the provision of public sector employment, characterized by gender-equal wage setting and family-friendly childcare policies (Gregory and Borland, 1999), shapes the gender gap in labor market outcomes and key life decisions for women, such as education and marriage. We show that as the public sector contracts, women adjust their human capital investment, family formation decisions, and labor market participation at various stages of life. These adjustments, which may differ from those of men, contribute to the gender gap throughout the life cycle.

China provides a compelling context for studying how public sector employment influences the gender gap throughout the life cycle. Specifically, we study the effects of the 1997 State-Owned Enterprises (SOE) reform, which led to the privatization of millions of small and medium-sized SOEs and Urban Collective-Owned Enterprises (UCEs) due to their inability to remain profitable. As a result, over 35 million workers were laid off in less than 5 years from 1997 to 2001 (Meng, 2000; Solinger, 2002; Hsieh and Song, 2015).[1] As illustrated in Figure 1, the share of workers in these two types of enterprises sharply declined following the reform. Simultaneously, an early retirement policy allowed women to retire as early as age 45, and many free childcare facilities provided by SOEs were shut down to cut costs. This reform ended the era of rigidly enforced gender equality in employment sustained by public sector jobs, introducing market competition for the first time.

We examine how the privatization of SOEs contributed to the gender gap in employment and earnings and influenced key life decisions for Chinese women, leading to the gender gap in areas such as human capital investment and marriage. We hypothesize that the reform disproportionately harmed women's labor market outcomes compared to men's. Women have historically been more represented in the public sector than in the private sector.[2] The public sector is characterized by less competition and greater wage compression. If women are more averse to competition (Gneezy et al., 2003; Booth et al., 2019), public sector jobs may be more attractive to them. Moreover, the public sector typically offers better family-friendly policies, which help women balance their careers and family responsibilities more effectively.

Additionally, we investigate how the reform influenced women's key life decisions in education investment and family formation, often made during early life stages. The direction of these effects is not obvious ex ante due to two competing forces. On one hand, the returns to education for

[1] The term *xiagang* ("step down from the post") was used in China to describe layoffs, avoiding the politically sensitive connotations of "laying off" in a socialist society.

[2] Globally, women represent 46% of the public workforce and 33% of the private sector. See the World Bank Report (2021).

women may have increased, as privatization placed greater emphasis on human capital, potentially encouraging women to invest more in their education. On the other hand, women might have chosen to complete their education and form families earlier if they perceived persistent discrimination in the labor market.

To address our research questions, we analyze more than ten waves of household surveys, complemented by a comprehensive, manually collected prefectural-level employment dataset. We calculate the prereform employment shares of SOEs and UCEs in each prefecture as a proxy for reform exposure, as these two enterprise types were primarily impacted by the reform. To identify the gender-differential effects of the SOE reform, we use an event study strategy with a triple-difference approach, leveraging gender, temporal, and geographic variation in reform exposure. Additionally, we conduct a difference-in-differences analysis by splitting the sample by gender to reveal how the reform affected men and women differently.

The impact of privatization varies across life stages as women face distinct trade-offs at each stage. To analyze this, we divide the sample into three cohorts based on their ages in 1997. First, we define the older cohort as those born between 1942 and 1952, aged 45–55 in 1997. This reflects China's early retirement policy during the reform period, which allowed women to retire as early as age 45.[3] Second, we define the middle-aged cohort as those born between 1952 and 1967, aged 30–45 in 1997. Finally, the youngest cohort, born between 1967 and 1982 and aged 15–30 in 1997, was faced with key life decisions such as education and marriage.[4]

During the later stages of the life cycle (aged 45-55), women face significant labor-family trade-offs, especially as they approach retirement. Our analysis reveals that the SOE reform widened the gender gap in employment and earnings for this older cohort, with women being more prone to layoffs and struggling to re-enter the labor market. This effect is largely driven by early retirement, reflecting the gender difference in retirement age. This finding aligns with the widening gender employment gap from 1992 to 2004, as illustrated in Panel (a) of Figure 2, and is consistent with the existing literature documenting this trend during the period (Gustafsson and Li, 2000; Li et al., 2006; Zhang et al., 2008; Liu, 2011; Chi and Li, 2014; Liu and Zuo, 2023).

For the middle-aged cohort (aged 30-45), while we do not find significant effects on the overall gender gap in employment, we do observe that the reform led to an increase in gender segregation across different sectors. Specifically, women were less likely to work in SOEs or the newly emerg-

[3]China's retirement age is significantly younger than those in developed countries. The standard retirement age in China is 60 for men and 55 or 50 for women, depending on occupation. As noted by Fang and Qiu (2023), Chinese workers typically reach peak earnings around age 35, with incomes declining thereafter—a pattern that differs from the trajectory observed in the U.S.

[4]In China, mandatory education lasts for nine years, typically covering ages 6 to 15 (i.e., from primary school to the end of junior secondary school). College enrollment typically begins at age 18, after students complete their senior secondary school education (high school). According to Figure 3, people get married around the age of 25-30 for the first time during the 1990s. Most of them have their first child soon after getting married.

ing private sector compared to men. Additionally, the reform caused an insignificant increase in the gender earnings gap within this cohort. We attribute these effects to women's lower educational attainment and their tendency to avoid competition in the private sector (Gneezy et al., 2003; Booth et al., 2019).

For the younger cohort (aged 15-30), women face a crucial decision regarding whether to pursue higher education or enter the labor and marriage markets. Our findings indicate that the reform resulted in fewer opportunities for young women than for young men to enter SOEs. In response to this disparity in labor market opportunities, young women were more inclined than young men to continue their education. This finding aligns with the documented increase in educational returns for women during the reform period (Zhang et al., 2005), consistent with the narrowing educational gap between men and women during the reform period, as shown in Panel (b) of Figure 2. Additionally, this age range often marks the beginning of marriage considerations. Consistent with previous literature (Chiappori et al., 2009; Bertrand et al., 2021; Zhang, 2021; Low, 2024a), we find that women delayed marriage alongside their extended education. This delay in marriage also appeared among young men, suggesting a general equilibrium effect.

We conduct a series of robustness checks to verify the validity of our results. Concerns may arise that the privatization movement were not randomly distributed across the country. Indeed, some prereform economic indicators, such as Foreign Direct Investment (FDI), are correlated with the prereform employment shares. To address such influence, we include interactions between prereform economic indicators, time, and gender dummies as additional controls, and our results remain consistent.

Key policies that may influence the education and fertility decisions of younger cohorts include the One Child Policy (OCP) and the expansion of higher education after 1999. First, we verify that the pre-reform regional sex ratio is not correlated with our measures of exposure to the SOE reform. Additionally, we control for regional fines as a proxy for OCP implementation and account for the number of college students to address the impact of college expansion. We also consider China's accession to the WTO in 2001, finding that our main results remain unchanged.

We attribute the gender gap observed over the life cycle to both demand- and supply-side factors. On the demand side, the reform may have reduced women's favorability in the labor market due to generally lower educational attainment. Using data from the 1990 and 2000 population censuses, we emphasize the role of industry composition in shaping this gap. Inspired by Wang et al. (2022), we construct a proxy for shifts in high-skilled industries at the prefecture level. Our findings reveal that prefectures with high prereform SOE employment shares experienced a larger expansion in high-skilled industries post-reform. Given women's initially lower educational levels, older and middle-aged women faced tougher challenges in the labor market. This increased demand for high-skilled workers corresponds with rising returns to education (Zhang et al., 2005),

potentially encouraging girls to invest more in their education.

Furthermore, we observe heterogeneity in college education among the middle-aged and older cohorts. The effects on the gender gap in SOE employment, overall employment, and earnings are primarily driven by those with lower educational attainment. In contrast, the gender gap in private sector employment is more pronounced among high-educated individuals. Although the employment was gender-balanced in the private sector before the reform, more men than women sorted into this sector after the reform, as more labor became available. This trend suggests either potential gender discrimination within the growing private sector or that women may have opted to avoid it due to the competitive work environment.

On the supply side, women may leave the labor market for two main reasons. First, an increase in overall family income can encourage women to specialize in household work. Our analysis shows that women with husbands who have some college education were more likely to exit the labor market than those with less-educated husbands, as higher education in husbands is associated with higher earnings. Second, the closure of childcare facilities previously provided by SOEs likely intensified childcare burdens. Although we lack direct data, our findings suggest that prefectures more affected by the reform saw a slower growth in new private kindergarten openings, indicating reduced demand for childcare outside the family due to increased caregiving responsibilities within families. Additionally, our analysis reveals a motherhood penalty for older women, as mothers with children under 13 were disproportionately impacted by SOE downsizing.

Finally, we demonstrate that the SOE reform had significant repercussions on traditional gender role attitudes. Using data from the World Values Survey (1990, 2000) and the China Women's Social Status Survey (1990, 2000), we find that the SOE reform notably worsened traditional gender role attitudes. The reforms resulted in married women having less decision-making power within their families, and women increasingly adhered to traditional gender norms in their beliefs (Cai et al., 2023).

This paper contributes to four key areas of literature. First, it advances the understanding of dynamic gender inequality (Goldin, 2014; Goldin and Mitchell, 2017; Salvanes et al., 2024). At younger ages, women's educational decisions involve a trade-off between pursuing higher labor market returns and facing lower marriage probabilities, influenced by a limited fertility window and prevailing gender norms (Chiappori et al., 2009; Bertrand et al., 2021; Zhang, 2021; Low, 2024a,b). As they enter the workforce, women encounter the dual challenge of career advancement and family responsibilities, which contributes to a persistent gender earnings gap over the course of their careers, despite similar initial earnings (Goldin, 2006; Bertrand et al., 2010). Our paper emphasizes how a specific labor market institution—the provision of public sector employment—shapes gender inequality across the life cycle.

Second, this study contributes to the extensive research on job displacement. Previous studies

consistently show that post-displacement earnings losses are enduring, with a more pronounced effect on women (Jacobson et al., 1993; Couch and Placzek, 2010; Davis and Von Wachter, 2011; Lachowska et al., 2020; Bertheau et al., 2022; Schmieder et al., 2023). For instance, Illing et al. (2024) find that women experience approximately 35% higher earnings losses than men after mass layoffs, with effects lasting for five years. We expand this understanding by examining the impact of large-scale layoffs in a transitional economy characterized by planned labor market institutions, emphasizing the importance of life stage. The SOE reform in China echoes with the German Reunification, which also provides a natural experiment of ending the central planning labor assignment system in East Germany in the 1980s.[5] However, many studies find that although the gender wage gap narrowed after the reunification, women were more likely to leave the labor market (Danthine and Hunt, 1994; Burda and Hunt, 2001; Hunt, 2002, 2004). In other words, the decreased gender wage gap is almost driven by a selective group of females. On the contrary, We find that women are affected differently at different life stages because of the SOE reform.

Third, this paper contributes to the discussion of the gender gap in the public sector. Gregory and Borland (1999) show that public sector jobs are often more attractive to women than private sector positions due to wage compression and better family benefits. Despite the existing gender earnings gap, job segregation rather than discrimination accounts for this disparity in the public sector (Jurajda, 2003; Albæk et al., 2017). We provide similar evidence on labor outcomes in the context of China's public sector downsizing. Additionally, we examine outcomes beyond labor, exploring how the availability of public sector employment influences key life decisions for women—such as human capital investment and marriage—and shapes gender gaps in these areas.

Lastly, our study contributes to the literature on China's SOE reform by examining its role in shaping gender gaps across the life cycle. While most existing studies do not establish a causal link between the reform and widening gender disparities, some compare gender earnings gaps between the 1980s and 1990s (Gustafsson and Li, 2000; Shu and Bian, 2003; Millimet and Wang, 2006), while others provide descriptive evidence suggesting a potential connection between SOE reform and the increasing gender earnings gap (Meng, 2012; Whalley and Xing, 2014; Jenq, 2015).[6] To the best of our knowledge, our paper is the first to rigorously investigate whether SOE reform directly contributed to rising gender inequality at the individual level. We also add to recent studies on the effects of SOE reform, which has explored its impact on savings, health, fertility, and entrepreneurship (He et al., 2018; Kong et al., 2019; Xie et al., 2022; Fang et al., 2023). Additionally, we contribute to the growing research on the motherhood penalty (Angelov et al., 2016; Kuziemko et al., 2018; Kleven et al., 2019a,b) by demonstrating that having younger children amplifies the

[5] Refer to Megginson and Netter (2001) for a thorough review of the effects of privatization.

[6] Additionally, several studies employ decomposition methods to analyze the factors contributing to the substantial gender earnings gap, though findings remain mixed (Bauer et al., 1992; Li and Dong, 2011; Shi et al., 2011; Liu and Zuo, 2023).

gender gap in earnings losses following the reform.

For the remainder of the paper, we discuss the reform background in Section 2 and introduce the data in Section 3. We present some descriptive evidence in Section 4, our main empirical strategy in Section 5, and show the results in Section 6. Section 7 concludes.

2 Policy Background

2.1 From Centralization to Market-Orientation

Before 1978, the Chinese economy was characterized by centralization, with the public sector dominating and production plans set by the central government (Naughton, 2007). Labor arrangements and wage rates were also entirely determined by the central government. [7] Upon graduation, individuals were assigned to the public sector, including governments, SOEs or UCEs, based primarily on their educational attainment and political background.[8] Employees were also provided with public housing, medical treatment for family members, and childcare and education for their children (Cai et al., 2008).

In 1978, under Deng Xiaoping's leadership, the Chinese government initiated a shift from a centrally planned economy to a market-oriented one. Firms were granted some flexibility in setting output plans, and individuals gained the ability to seek jobs independently. At the same time, various forms of ownership began to emerge. Medium-sized and small SOEs were decentralized and placed under the control of local governments as UCEs. Private firms, including those with foreign ownership, gradually entered the Chinese economy (Meng, 2000; Zhu, 2012). Despite these changes, the reform process was slow, and many SOEs and UCEs continued to struggle with inefficiencies, overstaffing, and other structural challenges.

By the mid–1990s, it became clear to the central government that most SOEs were struggling to compete with the growing private sector due to a lack of incentive schemes for workers and managers (Lin et al., 1998; Lin and Tan, 1999; Perkins, 1994). For instance, nearly half of these SOEs were operating at a loss, and the number of redundant workers was estimated to be 20-30% of the total workforce (Yao, 2007). In 1997, the central government endorsed SOE reform (Frazier,

[7] One important reason for this system was the strict residence registration system, known as *hukou*, which almost completely prohibited migration between rural and urban areas. Until the late 1980s, China's economy was divided into two mutually exclusive parts.

[8] Generally, political background referred to the duration of an individual's membership in the Communist Party. No individual was allowed to search for a job independently, and no work unit could select workers autonomously (Meng, 2000; Liu and Zhang, 2008). In addition, individuals were not allowed to quit or change jobs except for promotions. These assignments were lifetime employments with fixed wages. There were eight wage levels for factory workers and technicians, and 24 levels for administrative and managerial workers, with some regional variations (Meng, 2000).

2006). [9]

Within 5–6 years, the central planning labor arrangement was abolished. After the SOE reform, all firms worked toward the goal of profit maximization and were free to hire or fire workers from the growing labor market. As a result, more than 35 million workers were laid-off.[10] In Figure 1, we show that SOE employment share declined from over 50% in 1992 to 30% post-reform, while UCE employment fell from 15% in 1992 to nearly zero. SOEs, owned by the central government, differed from UCEs, which were owned by local governments or communities. SOE workers enjoyed greater job security, higher educational attainment, and social status before the reform. Post reform, new entrant workers no longer enjoyed the security of non–contract life–time employment, and their wages were determined by market forces. Although the new SOE still had some monopolistic power in several specific sectors, they did not bear any other social responsibilities as before (Lee, 2000; Solinger, 2002).

Previous studies have demonstrated the positive impact of the SOE reform on the Chinese economy, notably mitigating overstaffing issues and enhancing overall efficiency within the public sector (Hsieh and Song, 2015; Berkowitz et al., 2017). Also, people who remained in the SOE sector after the reform enjoyed a SOE wage premium (Ge and Yang, 2014). Nonetheless, our own work (Xu and Zuo, 2023) highlights an additional facet of these reforms, revealing their unintended consequence of exacerbating income inequality. It indicates that, in comparison to prefectures with lower initial SOE employment shares, those with higher proportions experienced not only diminished employment rates but also reduced income levels.

2.2 A Dramatic Shift: Deteriorating Labor Market Conditions for Women

In this section, we provide background on how labor market conditions worsened for women following the reforms, focusing on gender-specific retirement policies and changes in childcare facilities.

The Gender-Specific Retirement Policy Understanding gender disparities in the labor market is important. In our context, these disparities may arise from retirement policies. Since the 1950s, the standard retirement age has been 50 or 55 for women and 60 for men, respectively. Women

[9] The *zhuada fangxiao* ("grasping the big, enlivening the small") policy was announced at the 15th Communist Party Congress in September 1997. The key component of the reform is to keep only a few large strategic sectors under state ownership and merge, privatize, or close most other medium–to–small firms. By the end of 2002, the number of SOE workers fell to 69.2 million, a 36.8% decline compared with the number in 1995. The issue of SOE reform was politically sensitive because life–time employment and equal pay with equal jobs were regarded as two key characteristics of a socialist society. The data from the National Bureau of Statistics suggests that the employment of SOE peaked at about 109.5 million in 1995.

[10] During the 1990s and early 2000s, the social safety net in China, including unemployment and disability insurance, was still in its nascent stages.

working in government and public institutions typically retire at 55, while those in other occupations, such as factory workers, service staff, and domestic workers, often retire at 50. Retirement is almost mandatory as people reach the standard age (Lei and Liu, 2018).

Starting from 1993, workers within five years of the normal retirement age could opt for early retirement (*Nei Tui*).[11] Initially receiving a lump-sum allowance based on salary and years of service, they later transitioned to retirement pension through the Social Insurance Administration upon reaching the normal retirement age (Giles et al., 2006; Lei and Liu, 2018).[12]

The early retirement policy exhibits significant gender bias. Men are required to wait until the age of 55 to access early retirement benefits, whereas women can retire as early as 45 years old. This policy could have enabled SOEs to potentially exploit the situation by laying off older female employees disproportionately.

We analyze the retirement patterns across genders both pre- and post-reform in Figure A3. We observe a lower proportion of males opting for retirement between the ages of 41 and 60 than females, which is consistent with the policy's requirement. Subsequent to the reform in 1997, both genders experience a significant uptick in retirement rates, with women notably witnessing a more pronounced surge, as shown in panel (a) and (b). This disparity was not evident upon the initial introduction of the early retirement policy in 1993, as depicted in panel (c) and (d), suggesting that individuals predominantly embraced it following the SOE reform in 1997.

Child Care Facility Before the reform, SOEs were responsible for providing subsidized childcare to their employees. This provision ensured that all working-age women could join the labor force and work full-time after completing school (Du and Dong, 2013). However, beginning in the mid-1990s, many enterprises ceased to provide subsidized childcare due to increasing pressure for profits accompanying the SOE reform. Consequently, women, especially those with young children or from low-income families, have withdrawn from the labor force in large numbers (Maurer-Fazio et al., 2011).

[11] According to "The Provision on the Placement of Surplus Employees of State-Owned Enterprises" (Promulgated by the State Council of the People's Republic of China at the 115th Executive Meeting on April 20, 1993, and effective as of the date of promulgation).

[12] Early-retired workers may receive payments to cover basic living expenses before reaching formal retirement age. However, SOEs were often under significant financial strain, meaning such payments were not guaranteed (Lee, 2000).

3 Data and Sampling

3.1 Urban Household Survey (UHS)

Our study employs the Urban Household Survey (UHS), which was conducted by the National Bureau of Statistics of China. This survey is a repeated cross-sectional dataset that includes detailed individual and household demographic information, such as gender, age, education attainment, marriage status, and a set of labor market variables.[13] We have access to 16 provinces covering 201 prefecture-level cities during the study period, 1992-2004. We exclude the cities that experience boundary changes over the period and the cities that have obvious measurement error in our treatment variables, resulting in a sample of 157 cities.

We restrict our study to individuals born from 1942 to 1982. They were aged 15 to 55 in the reform year 1997.[14] We further restrict our sample to non-migrants by dropping individuals without local registration (Hukou) who have limited access to education, medical care, and social welfare in the place they reside, as regulated by China. Migrants account for a small proportion of the sample, constituting only 2% after 2002, with no migrants present in the survey before that year. Migration might impose a threat to our identification strategy, but we argue that migration is quite limited in 1990s China due to the Hukou restriction.[15]

Two sampling issues arise with the use of the UHS in our study. The first issue is the over-representation of SOE employees, a problem that was identified by Ge and Yang (2014) and Feng and Guo (2021). The second issue arises from a major reform of the UHS in 2002, which tripled the sample size. To address these issues, we implement a reweighting strategy following our own paper (Xu and Zuo, 2023): we create the weight of each individual according to their employment type by comparing the public sector's employment share in the UHS and the statistical-yearbook data. Also, we adjust the weight with reference to the sample-size difference before and after 2002. We present details of our weighting process and the validity of the strategy in Appendix A.

We present individual characteristics, including age, marital status, years of schooling, and

[13] The UHS doesn't marriage status before 2002, so we infer this information according to each member's relationship to the household lead. We provide more details in Appendix B.

[14] We choose the lower bound age 15 as this is the lowest age for labor force participation in China. We also take the retirement age in consideration, which is 60 for men and 55 or 50 for women, respectively.

[15] We note a discrepancy between wage and working status information in our dataset, where some individuals may claim not to be working but report positive wage income, and vice versa. These discrepancies account for approximately 2-3% of the total observations. As our focus is on any form of labor attachment, we choose to assume that wage income accurately reflects labor market engagement. To this end, we redefine the working status variable based on wage income. Specifically, we classify individuals with wage income as employed and in the labor force, and individuals with labor income are considered to be in the labor force regardless of their self-reported working status. Conversely, individuals with no wage income are assumed to be not employed, and those with no labor income are considered to be out of the labor force. This approach ensures that we capture any kind of labor attachment as a labor market outcome while minimizing the impact of the discrepancies in our data.

employment status by gender in Table A2. From the period before the reform (Panel A) to the period after the reform (Panel B), we observe that workers became slightly older, more educated, and experienced lower employment rates. Within each time period, females have similar ages to men, but they have lower educational attainment, lower employment rates, and are more likely to be married.

3.2 Prefecture-level Data

We use prefecture-level data obtained from various China's statistical yearbooks for two purposes.[16] First, these data play a vital role in calculating the extent of prefecture exposures to the SOE reform. Second, we employ a weighting strategy (discussed in Appendix A) that adjusts the employment composition in the UHS based on the information provided by the statistical yearbooks.

To obtain the employment data (coded as *zhigong*) at prefecture level for our analysis, we collected information from three sources: Provincial Statistical Yearbooks, City Statistical Yearbooks, and China Statistical Yearbook for Regional Economy. From these statistical yearbooks, we use the employment data coded by formal employment (*Zhigong*) rather than any type of employment (*Jiuye*). This is because the broader definition of employment (*Jiuye*) also includes contractual workers, who lack job security provided by the public sector, are not the target of the reform.[17]

3.3 Other Supplementary Data Sources

We also employ other data sources for supplementary analysis. We use the China Health and Retirement Longitudinal Survey (CHARLS) to do robustness checks, the population census to study industry composition change, and the World Value Survey and the China's Women Social Status Survey to conduct analysis on gender norms.

[16] A statistical yearbook in China is an annual publication that compiles and presents comprehensive data on economic, social, and demographic indicators.

[17] In terms of the employment data from the Statistical Yearbook, we notice a new definition of formal employment, working employment (*zaigang zhigong*) emerging after 1998 as a response to the massive layoff during the reform. This is due to some laid-off workers continuing to receive partial compensation from their former employer, even though they are no longer working. As a result, these workers are classified as non-working employment and are included in the formal employment (*zhigong renshu*) but not in the working employment (*zaigang zhigong*). Therefore, we use the working employment (*zaigang zhigong*) measure for the employment variable. For years before 1999 when only a single definition of formal employment (*zhigong renshu*) is available, we assume that the two definitions are equivalent. We encountered data missing problems in the numerator, so we first digitized data from the provincial and city statistical yearbooks. We then used the China Statistical Yearbook for Regional Economy to fill in the missing data for the working employment (*zaigang zhigong*) from 1999 to 2004. For the missing data prior to 1999, we used linear interpolation.

The China Health and Retirement Longitudinal Survey (CHARLS) CHARLS is a nationally representative survey that focuses on the dynamics of health, aging, and retirement among individuals aged 45 and above within the Chinese population. Leveraging retrospective questions administered in 2011, 2013, 2015, and 2018, we construct a distinct individual panel spanning from 1992 to 2004 to examine marriage status and fertility trends.

An inherent limitation of CHARLS is its exclusion of younger individuals, as the survey targets only those aged 45 and above at the time of data collection. Consequently, we combine the middle-aged and younger cohort to examine the effects on marriage and fertility using this dataset as a robustness check.

Population Census 1982, 1990 and 2000 We use the census data from 1990 and 2000 to provide a comprehensive analysis of the changes in industry composition post reform. Additionally, we use the 1982 and 1990 Census to address the confounding effect of the One Child Policy and biased gender norms, proxied by regional sex ratio in our analysis.

World Value Survey (WVS) The World Value Survey (WVS) is a comprehensive international research initiative investigating social attitudes across diverse countries and populations, offering valuable variables related to gender role attitudes. We use China's WVS data in wave 1990 (before the reform) and 2000 (after the reform), two years that contain 11 provinces and 1,500 individuals to study the effect on gender role attitudes.

China's Women Social Status Survey We also complement our analysis of the effect on gender role attitudes by using the data from China' Women Social Status Survey. It is also a nationally representative repeated cross-sectional survey, but it surveyed more than 30,000 women. And it provides detailed information on women's family status, including their relative income, family responsibilities, and etc. Thus, we can create different index other than using WVS to measure gender role attitudes.[18]

4 Motivating Facts

To motivate our life cycle analysis, we provide descriptive evidence of the gender gap over the life cycle before and after the reform in this section.

[18]This administrative survey was jointly conducted by All-China Women's Federation and National Bureau of Statistics of China. They conduct the survey every 10 years. Up until now, there are four waves in total: 1990, 2000, 2010, and 2020 and we use 1990 and 2000 two waves.

4.1 Cross-Sectional Profiles across Gender

Economic events may impact individuals' important economic decisions making process, which is tied to life stages (Salvanes et al., 2024). In addition, this may differ by gender . We illustrate this fact by demonstrating significant differences in cross-sectional age profiles in employment, earnings, and marriage across genders before and after the SOE reform in Figure 3.[19]

Intriguing patterns emerge in labor market dynamics pre- and post-reform across panels (a)-(c). First, there is a notable delay in the labor market entry among younger cohorts, with a decline in employment rates across all ages observed for both genders post-reform, albeit more pronounced among women. Notably, owing to gender disparities in retirement ages, women commence retirement as early as 45 years old, in contrast to men who sustain high employment rates until the age of 55, even post-reform. Second, the SOE/UCE employment displays even more pronounced fluctuations, with substantial declines evident across all age groups for both genders, particularly among women.

Third, our analysis extends to age-earning profiles, revealing a notable surge in earnings post-reform attributable to economic development, with men reaping greater benefits. In a manner akin to patterns observed in developed countries (Manning and Swaffield, 2008; Bertrand et al., 2010), despite men and women initially attaining similar income levels, disparities become apparent in their late twenties. Men experience a peak in earnings after the age of 35, maintaining relative stability until 55, whereas women reach their earnings peak at 30, which is sustained for only a decade due to early retirement.[20] Panel (d) of Figure 3 illustrates a trend of delayed marriage for both genders post-reform, albeit women tend to marry at younger ages than men.

4.2 Gender Disparities across Birth Cohorts

In Figure 2, we depict the educational attainment of each birth cohort disaggregated by gender. Each cohort's educational trajectory reflects China's socio-political landscape over the past five decades, characterized by distinctive historical events. For instance, the birth cohort spanning 1945-1950 encountered the Cultural Revolution, which precipitated a decline in educational attainment. Subsequently, China embarked on a series of economic reforms aimed at transitioning from a centrally planned economy to a market-oriented one. Notably, the cohort spanning 1950-1965 witnessed a gradual increase in educational attainment, albeit with a persistent gender gap in education. However, post-1965 cohorts exhibit a noteworthy trend of narrowing gender differentials in educational attainment. This trend becomes particularly pronounced among individuals

[19] We provide the the same analysis for different kinds of employment and education in Figure A6.

[20] Our findings align with those of Fang and Qiu (2023), who also observe a peak in men's earnings at 35, followed by a subsequent decline post-2005.

born within the cohort spanning 1967-1982, who were in the pivotal age range of 15-30 years during the SOE reform of 1997.

In Figure A8 - A11, we examine labor market dynamics and marriage patterns spanning the years 1992 to 2004 across three distinct cohorts, delineated by their respective ages in 1997. The eldest cohort, born between 1942 and 1952, represented individuals aged 45-55 in 1997; the middle-aged cohort, born between 1952 and 1967, comprised individuals aged 30-45 in 1997; while the youngest cohort, born between 1967 and 1982, encompassed individuals aged 15-30 in 1997. Each cohort manifests unique behavioral trends within the specified time frame.

Regarding labor market outcomes (Figure A8 - A9), discernible gender differentials emerge among the older and middle-aged cohorts. Women within the older cohort experienced a pronounced decline in both employment participation and earnings even preceding the reform, attributable in part to early retirement practices. Subsequently, this gender gap became more pronounced across both middle-aged and older cohorts. Conversely, within the younger cohort, women initially entered the labor force at a younger age than men prior to the reform. However, post-reform, this gap rapidly diminished, with female employment rates and earnings lagging behind in subsequent years.

Turning to marriage dynamics (Figure A10), the middle and older-aged cohorts exhibit relatively stable trends, whereas the younger cohort demonstrates a gradual progression towards marriage, with females tending to marry earlier than males.

5 Empirical Strategy

Our empirical strategy draws on variation across three dimensions: geographic, temporal, and gender. For geographic variation, we utilize differences in exposure to the reform due to historical factors predating the SOE reform. China's structural economic reform, which marked the shift from a centrally planned economy to a market-oriented one, began in 1978. Between 1978 and 1990, diverse ownership structures emerged as some medium-sized and small SOEs were decentralized and transferred to local governments as UCEs. Private firms, including those with foreign ownership, also gradually entered the Chinese economy (Meng, 2000). This created varied levels of exposure across prefectures, resulting in a diverse composition of ownership across regions. We leverage this variation, employing difference-in-differences and triple-differences event study approaches to causally identify the differential effects of SOE reform on women and men.

5.1 Measures of the Geographical Exposures to the Reform

We use the share of SOE and UCE employment in 1992 (the beginning year of our analysis) as the exposures to the reform.[21] In 1992, individuals could work in either the public or private sector, or be self-employed. Public employment includes SOE, UCE, and government workers, with only SOE and UCE workers affected by the reform.

The definition of treatment variables is presented in Equation 1 and 2. We calculate the affected employment as the numerator, using the 15-64 non-agricultural population[22] as the denominator. The population data is sourced from the 2000 Population census.

$$\text{Prereform SOE Emp Share}_p = \frac{\text{Affected SOE Employment}_{p,1992}}{\text{Working-Age Population}_p} \tag{1}$$

$$\text{Prereform UCE Emp Share}_p = \frac{\text{Affected UCE Employment}_{p,1992}}{\text{Working-Age Population}_p} \tag{2}$$

We construct affected SOE and UCE employment as follows. Some industries experienced more layoffs than others during the reform (Lee, 2000).[23] Data from the China Labor Statistical Yearbook show that certain one-digit industries were not the targets. To create a more precise measurement of the proxy for the reform, we exclude from the numerator such one-digit industries, including government, agriculture, finance, real estate, health, and education.[24] Specifically, we refer to the 1990 population census, which provides industry-specific employment information for each prefecture. Given that the 1990 Census does not offer any employment data categorized by ownership type, we consult the China Labor Statistical Yearbook to obtain information on the proportion of SOE and UCE workers in each industry.[25] Using these proportions, we calculate the shares of employment by industry and ownership type out of the overall working-age nonagricultural population.[26] In this way, we manage to exclude the unaffected industries in SOE and UCE employment from the prereform shares.

We provide the summary statistics of the employment shares by prefecture in Table A4. The means of the raw SOE and UCE employment shares are 0.46 and 0.17 respectively prior to the

[21] Existing studies of the SOE reform either pool SOEs and UCEs (He et al., 2018; Kong et al., 2019) or consider just SOEs (Xie et al., 2022) in their empirical analysis. Our own paper (Xu and Zuo, 2023) show that these two exposures lead to different predictions in our setting.

[22] The Hukou system in China categorizes individuals based on their agricultural or non-agricultural attributes.

[23] For example, sunset industries include textiles, arms, heavy machinery production, and chemical engineering that use outdated production facilities.

[24] However, they still contributed to a significant portion of total SOE and UCE employment, particularly in the case of SOE employment (Lee, 2000): more than 90% of employment in these industries was in SOEs in 1992.

[25] We provide this information in Table A3.

[26] We adjust for population growth from 1990 to 2000.

reform. After changing the raw employment to the affected employment in the numerator, the two shares drop to 0.32 and 0.15.[27] We observe big variations in both of the prereform shares, and the correlation between them is close to zero, as shown in Figure A15.

Figure 4 shows the regional variations in prereform SOE share and prereform UCE share. We observe significant geographical variations in these two measures. For example, the southwestern areas have high proportions of SOE employment and the northeastern areas have high proportions of UCE employment prior to the reform.

We validate that areas with a higher prereform SOE and UCE employment share experience a bigger reduction in public employment share than those low prereform share areas. This reduction in public employment serves as a proxy for layoffs, as we lack direct data on layoffs at the prefecture level.[28] We present the correlational result in Figure A17.

Furthermore, there may be concerns that geographical variation in ownership composition correlates with other economic factors, potentially confounding the observed gender gap. To investigate this correlation, we regress prereform employment shares on prefecture-level economic indicators from 1992. The data for this analysis are sourced from the City Statistical Yearbook. The regression results are summarized in Figure 5. The figure shows that, while the treatment variables are generally not correlated with most indicators at the 95% confidence level, significant correlations do exist with some indicators, including *FDI/GDP*, *GDP per capita*, and *Electricity per capita*. These indicators are all negatively correlated with the prereform employment shares, as they reflect the openness and development of the economy. This suggests that more developed and open economies were less affected by the reform. We assume that these correlations do not impact our analysis of the gender gap. We control for these indicators in our robustness checks in Section 6.6.

5.2 A Differences-in-Differences Approach

$$\begin{aligned} Y_{ipt} =& \alpha + \beta_1 \text{Post}_t \times \text{Prereform SOE Emp Share}_p + \beta_2 \text{Post}_t \times \text{Prereform UCE Emp Share}_p \\ &+ \alpha_{Age} + \delta_t + \gamma_p + \varepsilon_{ipt} \end{aligned} \tag{3}$$

To show how the reform take affects differently by gender, we split the sample and conduct a

[27] A tiny proportion of the adjusted prereform SOE share is negative because of measurement error across multiple data sources.

[28] $\text{Reduction in Public Employment}_p = \frac{\text{Public Employment}_{p,1996}}{\text{Working-age Population}} - \frac{\text{Public Employment}_{p,2000}}{\text{Working-age Population}}$. Figure A16 presents a prefecture-level map illustrating the reduction in public employment share. Figure A18 shows a province-level map of actual layoffs, using data from China's Labor Statistical Yearbook. Both maps display similar variation. Please see more details in Appendix C

double-diff design as shown in Equation 3, where i represents individuals, p denotes prefectures, and t signifies the survey year. We exploit the variation at prefecture and temporal level. We use both the *Prereform SOE Emp Share* and *Prereform UCE Emp Share* as the geographical level proxies to the reform. The outcome variables include labor market outcomes, education investment, and marriage status. $Post_t$ is 1 if year t is 1997 or after, and 0 otherwise.

We control for the dummies of Age_{ipt} to account for any age-specific outcomes, such as educational attainment.[29] γ_p represents prefecture fixed effect, controlling for unobservable time-invariant differences across prefectures, such as the difference in the prereform economic indicators in 1992, as discussed in Section 5.1. Additionally, we include year fixed effect, δ_t, to control for common shocks affecting all the prefectures. We cluster the standard errors at the prefecture level and employ the reweighting strategy to address the sampling issue as discussed in Section 3.

We compare the coefficients across the male and female samples to examine the gender-differential effect. We also employ an event study approach corresponding to the double-diff. This approach offers two key advantages. First, it enables us to examine the effect over a period of time, thereby enhancing our understanding of how the reform affects the labor market dynamics by gender. Second, by examining the coefficients prior to the reform period, we can also assess the pre-reform trend to verify the parallel trend assumption.

5.3 A Triple-differences Event Study Approach

$$
\begin{aligned}
y_{ipt} =& \beta_0 + \sum_{e=1992}^{2004} \beta_e \text{Prereform SOE Emp Share}_p \times \text{Year}_t \times \text{Female}_i \\
&+ \sum_{e'=1992}^{2004} \beta'_e \text{Prereform UCE Emp Share}_p \times \text{Year}_t \times \text{Female}_i \\
&+ \sum_{f=1992}^{2004} \beta_f \text{Prereform SOE Emp Share}_p \times \text{Year}_t \\
&+ \sum_{f'=1992}^{2004} \beta'_f \text{Prereform UCE Emp Share}_p \times \text{Year}_t \\
&+ \sum_{g=1992}^{2004} \beta_g \text{Year}_t \times \text{Female}_i + \alpha_{Age} + \delta_t + \eta_{pg} + \varepsilon_{ipt}
\end{aligned} \tag{4}
$$

In addition to the geographical and temporal level, we add a gender level and conduct a triple-difference event study design as shown in Equation 4, where i represents individuals, p denotes prefectures, t signifies the survey year, and g stands for gender.

[29] We can't control for education attainment since it is a major outcome for the young cohort analysis. The results don't change much if we control for it to study the labor market outcomes of the older and middle-age cohort.

The coefficient of interest in our analysis is denoted as β_e, which captures the differential impact of the SOE reform across genders. Since our primary focus is on examining the gender-specific effect of the SOE reform, it is crucial to include controls for the interaction between the variation in each of the two dimensions. First, we incorporate an interaction term between the binary variable $Female_i$ and the indicator variable $Year_t$, which serves as a control for the national gender differential trend. To provide some context, Figure A7 and A9 illustrate the increasing gender gap in employment and earnings over the study period. However, there might be other policies or factors contributing to the gender gap in China. For example, Wang et al. (2022) found that increasing import competition played a role in retaining more females in the workforce, thereby mitigating the otherwise growing gender employment gap in the long run.

We also interact the geographical exposure with time indicators. They absorbs the overall effect of the SOE reform on China's urban labor market (Xu and Zuo, 2023), allowing us to isolate the gender differential effect.

Additionally, we introduce a prefecture-gender fixed effect to capture time-invariant gender norms specific to each prefecture. Existing literature has demonstrated that historical gender norms can intrinsically affect female labor supply (Qian, 2008). Such interaction distinguishes the triple-difference design from the double-difference by controlling for more confounders.

We employ the same reweighting strategy as shown in Appendix A. We cluster the standard errors at the prefecture level.

6 Results

We classify our results into three cohorts based on 1997 to present a life cycle perspective: the older (born 1942-1952, aged 45-55 in 1997), middle-aged (born 1952-1967, aged 30-45 in 1997), and youngest (born 1967-1982, aged 15-30 in 1997). We summarize the results for the three cohorts in Table 1-3. In each table, we present the double-diff results for each gender from Equation 3, as well as the triple-diff results from Equation 4.

In this section, we only discuss the coefficients for the treatment variable *Prereform SOE Emp Share*. This is because *Prereform UCE Emp Share* doesn't exhibit gender-differentiated effects in prefectures with higher exposure. This disparity in the effects can be attributed to the distinct declining employment share trends for SOEs and UCEs observed in Figure 1. We note that the employment in SOEs decreased by approximately 40%, while the decline in UCE employment exceeded 70%. Given the notably more substantial layoffs within UCEs compared to SOEs, it's understandable that a comparatively weaker gender differential effect is evident within the UCE sector. One plausible explanation for this pattern is from an employer's standpoint. When compelled to enact significant layoffs, UCEs might have been less inclined to differentiate between

workers based on gender. Instead, the emphasis could have been on indiscriminate workforce reduction, affecting both genders, and subsequently leading to a muted gender differential effect.

6.1 The Older Cohort (1942-1952): Employment and Earnings Gap

We first present the employment and earnings outcomes for the older cohort. During the reform period, women born in this cohort were aged 45-55. At this age, women had usually already formed families and faced a labor-family trade-off. This cohort was also subject to a gender-biased early retirement policy. Women were systematically closer to the retirement age compared to men, allowing employers to take advantage of this and lay off more women.

To illustrate the impact, we present the results featuring the treatment variable *Prereform SOE Emp Share* in Table 1 and Figure 6. Our findings reveal a gender disparity in the consequences of layoffs, as highlighted by the SOE Employment outcome. While both genders were adversely affected, females were disproportionately more likely to experience layoffs. Panel (a) of Figure A21 shows that the negative effect on women persisted over time.

In Table 1, we demonstrate the effects on employment and earnings. Men experienced smaller impacts, indicating more successful re-employment. However, women encountered challenges re-entering the workforce, leading to negative effects on both employment status and earnings. We further show the retirement outcomes, indicating that women opted for early retirement. This suggests that the gender-specific effects within the older cohort were driven by the gender-specific retirement policy.

In terms of the effect size, the coefficient of SOE employment is -0.382, meaning that 1 p.p. more in SOE employment prior to the reform led to 0.382 p.p. increase in employment gender gap. By interacting with the mean of prereform SOE employment share (0.32), the results show that the SOE reform led to 12.2 p.p. increase in SOE employment gender gap for a prefecture with mean of the exposure, compared to the prefecture with zero exposure.

The coefficient of overall employment is -0.27, the size of which is slightly smaller than that of SOE employment. This indicates that although females were more likely to experience layoffs during the reform, some managed to secure re-employment. By interacting with the mean of prereform SOE employment share (0.32), the results show that the SOE reform led to 8.6 p.p. increase in employment gender gap for a prefecture with the mean exposure, compared to the prefecture with zero exposure.

We also examine the effect on earnings. We use the inverse hyperbolic sine (ihs) transformation for the income variable, and we interpret the effect in percent. The coefficient is -3.102, meaning that 1 p.p. increase in prereform SOE employment share led to 3.102% increase in earnings gender gap. Interacting with the mean of prereform SOE employment share (0.32), the results indicate a

99% increase in the earnings gender gap associated with average exposure due to the reform. We further decompose the effect into extensive and intensive margins. To calculate the extensive earnings effect, we interact the overall employment coefficient (-0.27) with the mean of the IHS-transformed earnings (6.49). This shows that the extensive margin reduces earnings by $0.27 \times 6.49 = 1.75$, accounting for 56% of the total effect. In contrast, the intensive margin accounts for the remaining 44% of the overall effect.

6.2 The Middle-aged Cohort (1952-1967): Sector Gender Gap

We present the results of the middle-aged cohort (aged 30-45 in 1997) in Table 2, panel (c) and (d) in Figure 6 (triple-diff results), and Figure A22 (double-diff results). We can still discern a larger negative impact of SOE employment on women, but such a differential effect is marginally insignificant in the triple-diff specification. Both men and women in the middle-aged cohort were not significantly affected in overall employment, indicating they were able to secure jobs even after layoffs. However, we find that middle-aged men benefited from the reform, as evidenced by the positive coefficient on the earnings variable. This effect was absent for women, with the triple-difference coefficient being negative but marginally insignificant.[30]

Moreover, we find that gender differences emerge in sectoral employment. Before the reform, while the private sector was small, its gender composition was relatively balanced. This balance may reflect a selection effect, where only higher-skilled women, willing to compete, entered the private sector. After the reform, however, women became less likely than men to work in the expanding private sector, likely due to increased labor availability and competition. Panel (b) illustrates a significant gender gap in private sector employment. Specifically, we observe null effects on private sector employment for males. In contrast, females who were exposed to higher levels of SOE employment before the reform experienced a relatively negative effect in private sector employment.

From a labor supply perspective, this may be linked to gender differences in attitudes toward competition. The public sector in China offers higher pay and more stable jobs , while the newly emerging private sector, filled with both opportunities and risks, posed challenges, particularly for workers used to lifetime employment. Given the competitive nature of the private sector, women may have opted out (Gneezy et al., 2003; Booth et al., 2019). On the labor demand side, there may have also been greater gender discrimination in the private sector. We provide more discussion in Section 6.4.

The coefficient of private employment is -0.145. To interpret the results, we compare a prefecture with the mean prereform SOE employment share to a prefecture with zero exposure. By

[30]This coefficient of the triple-diff is significant when considering more controls and using Poisson regression, as shown in Table A10 and A12.

interacting the coefficient with the mean prereform SOE employment share (0.32), the results indicate that the SOE reform leads to a 4.6 p.p. increase in the private employment gender gap.

6.3 The Younger Cohort (1967-1982): Labor Market, Education and Marriage Gap

In this paragraph, we discuss the results of the younger cohort (aged 15-30 in 1997), as shown in Table 3 and A5, panels (e) and (f) in Figure 6 (triple-diff results), and Figure A23 and A24 (double-diff results).

Labor Market Opportunities Our initial examination focuses on labor market outcomes. First, young women had fewer opportunities in SOE employment, while the effect on men was null, resulting in an enlarging gender gap in SOE employment. By interacting the coefficient -0.207 with the mean prereform SOE employment share (0.32), the results indicate that the SOE reform led to a 6.6 p.p. increase in the SOE employment gender gap associated with mean exposure. This result could be due to the efficiency improvements in SOEs after the reform (Hsieh and Song, 2015; Berkowitz et al., 2017). Women might have fewer opportunities in the public sector if they were perceived as less productive than men.

Second, we find that the effects on overall employment are negative for both men and women, with the impact being slightly larger for women. This suggests broader challenges in the labor market after the cessation of job assignments, as reflected in the positive coefficients for unemployment among both genders in Table A5. Younger workers, unfamiliar with a fully competitive job market, may have needed more time to adjust. A similar pattern emerged in the earnings outcomes, where the effects were negative for both genders, with women experiencing a slightly, though insignificantly, larger decline. We observe null impact in private employment for both genders.

Education Investment We observe significant distinctions in education investment responses across genders, as shown in Table 3. Specifically, women increased their education investment, while men decreased theirs. This effect is evident at both the high school and college levels, as shown in Table A5. To interpret the result for years of education, we interact the coefficient of 0.886 with the mean prereform SOE employment share (0.32). The SOE reform reduced the gender gap in education by 0.28 years for those with average exposure. These results could explain the closing gap in educational attainment across genders, as shown in Figure 2. Overall, the gender gap in education shrunk by 0.91 years for the young cohort, with our estimate explaining 30% of this reduction.

Since the capacity for education provision is gender-neutral, we explore the following potential mechanisms. First, we contend that the education result was driven by structural changes in the labor market. As previously shown, women faced worse labor market opportunities compared to men. Recognizing this, young girls may have chosen to extend their education to better compete. This suggests that labor market opportunities can influence the gender education gap, similar to findings in the Iranian context (Moeeni and Tanaka, 2023). This trend is also related to the increasing returns on education during the reform period, as discussed by Zhang et al. (2005). We provide further empirical evidence in Section 6.4 showing that the SOE reform led to these increasing returns. As shown in Figure 2, women started from a lower educational level and could benefit more from additional investment in education.

Second, we find no clear evidence that younger women perceived discrimination in the labor market, aligning with Dong and Zhang (2009). Instead, the reform encouraged them to invest more in education to enhance their competitiveness.

Third, the parents of the younger cohort may have been affected by the massive layoffs, which could help explain why men in more exposed prefectures experienced a relatively slower increase in human capital accumulation. Specifically, the layoffs of younger men's parents could have led to a negative income shock, prompting young men to leave school earlier and enter the labor force prematurely. However, this parental layoff channel cannot account for the finding that the reform led young women to extend their education more than young men. Research suggests parental income shocks typically harm daughters' education more than sons' (Björkman-Nyqvist, 2013; Dessy et al., 2023), making it unlikely that parental layoffs drove the observed gender difference in educational outcomes.

As a robustness check, we show null effects of education attainment in Figure A26 for the older and the middle-aged cohort, as they had finished their education investment by the reform year.

Marriage Outcomes We also investigate the effect on marriage outcomes since the younger cohort also made such key decisions during the reform period. Consistent with prior literature (Chiappori et al., 2009; Bertrand et al., 2021; Zhang, 2021; Low, 2024a), we find that women delayed marriage along with education extension. Our results indicate a negative effect of the SOE reform on marriage rates for both genders, with no significant gender differences in marriage as general equilibrium outcomes. When women of similar age stayed in school longer and delayed marriage, men also postponed marriage.

Marriage timing is also influenced by anticipated household bargaining power at the onset of marriage, with expected earnings playing a key role in determining this bargaining power (Lise and Yamada, 2019). If women expect lower income relative to their potential partner, they may invest more in education to enhance their earning potential and gain greater bargaining power within

marriage. Thus, it is unsurprising that both men and women might choose to delay marriage.

We do not observe significant effects for the older and middle-aged cohorts in Figure A26. This suggests that the reform does not impact family dynamics once marriage has already been established.

6.4 Mechanism

In this section, we explore mechanisms from both the demand and supply sides that explain the gender gap across different life stages.

On the demand side, using the method of Wang et al. (2022), we show that the SOE reform led to the relative growth of high-skilled industries. Since women tended to have lower skill levels than men, they were likely more negatively affected in the labor market. This finding supports the increasing returns to education for women during this period, as noted by Zhang et al. (2005). We then conducted a heterogeneous analysis for the older and middle-aged groups by college education.

On the supply side, women may have exited the labor market voluntarily or involuntarily for two main reasons. First, rising family income could have incentivized women to specialize in household work (Goldin, 1994). Our heterogeneous analysis shows that women were more likely to leave the labor force in families with highly educated husbands. Second, the closure of childcare facilities previously provided by SOEs may have forced women to take on more domestic responsibilities, as they have historically shouldered a greater share of childcare duties. To test this, we collected regional-level kindergarten data and found a negative impact of the SOE reform on the establishment of private kindergartens, suggesting reduced demand for external childcare. Additionally, we observed that the gender employment gap widened more in families with children than in those without.

Beyond supply and demand factors, gender-specific retirement policies further contributed to the growing gender employment gap, particularly among the older cohort.

Increase in Demand for High-skilled Workers Workers in different industries exhibited significant variations in educational attainment. For example, the average years of education in the mining industry was 8.37, compared to 12.15 in the education sector, according to the 1990 census. If the SOE reform led to the relative expansion of high-skilled industries, women may have been more adversely affected due to their initially lower levels of educational attainment.

We establish a causal link between the SOE reform and the demand for high-skilled workers by constructing a shift-share measure inspired by Wang et al. (2022), as shown in Equation 5. The share component utilizes the initial average years of education in each two-digit sector s

at the national level, Years of Education$_{s,0}$, derived from the 1990 census. The shift component, E_{spt}/E_{pt}, captures employment changes in sector s within prefecture p between 1990 and 2000.[31] The overall shift-share measure reflects changes in sectors demanding workers with higher educational attainment. Similarly, we calculate the high-skilled occupation share within each industry based on the occupation classification from the 1990 census, categorizing legislators, senior officials, managers, technicians, and professionals as high-skilled occupations. This measure is positively correlated with educational attainment. We also create a comparable measure, as shown in Equation 6.

$$\text{Education Index}_{pt} = \sum_{s=1}^{S} \left(\frac{E_{spt}}{E_{pt}} \times \text{Years of Education}_{s,0}\right) \tag{5}$$

$$\text{Occupation Index}_{pt} = \sum_{s=1}^{S} \left(\frac{E_{spt}}{E_{pt}} \times \text{High-skilled Occupation Share}_{s,0}\right) \tag{6}$$

$$\text{Female Index}_{pt} = \sum_{s=1}^{S} \left(\frac{E_{spt}}{E_{pt}} \times \text{Female Employment Share}_{s,0}\right) \tag{7}$$

We regress the change in the Education Index and the Occupation Index from 1990 to 2000 on both the prereform SOE and UCE employment share, presenting the results in the first four columns of Table 4. We observe significant positive coefficients, even after controlling for economic indicators in 1992, including the working-age population, GDP per capita, and FDI as a percentage of GDP. This indicates that the SOE reform closed some inefficient low-skilled sectors, leading to a relative expansion of the high-skilled sector after the reform.

These results are consistent with an overall increase in demand for high-skilled workers. As shown in the table, the average years of education for workers increased by 0.35 from 1990 to 2000. Given that women started from a lower educational level, as shown in panel (b) of Figure 2, older and middle-aged women could be more disadvantaged in the labor market post reform. This pattern is also reflected in the education outcomes of the younger cohort. Girls may have recognized their educational disadvantage and responded by investing more in education, thereby narrowing the gap with boys.

This finding also aligns with previous literature showing that the return on education increased from 1988 to 2001 (Zhang et al., 2005). Specifically, the authors also find that the return on education for females is higher than for males. Consequently, the SOE reform prompted younger girls to invest more in education compared to boys.

We further investigate whether the reform led to a contraction in female-dominated industries. Following a similar approach to the education index, we construct measures for female-intensive

[31] Due to industry classification changes, we manually align the classification systems across the 1990 and 2000 censuses. We exclude the agriculture sectors in this part of the analysis.

industries, as defined in Equation 7. The female employment share in each industry is calculated using 1990 data. We then use changes in this index to capture the expansion or contraction of female-oriented industries. Overall, we do not find evidence suggesting that the SOE reform caused such change.

Demand-side: Heterogeneous Effects by College Education We further examine the heterogeneous effects of college education on the middle-aged and older cohorts, as shown in Table 5. College education was rare in the pre-reform years, so the sample size of the college-educated population is only about one-third of those without any college education.[32] Additionally, individuals with some college education were more likely to hold white-collar jobs, while those without college education often held blue-collar jobs, where men may have had an advantage.

We hypothesize that the SOE reform had a minimal impact on the gender gap in employment within the group with some college education, as both genders were in high demand post-reform. We observe this pattern in overall employment, SOE employment, and earnings. However, the opposite is true in private sector employment. The private sector tends to favor more highly educated workers, as shown in Figure A12, but the gender gap within this group indicates a preference for men. This difference may be driven by two factors. First, there could be employer gender discrimination in the private sector. Second, women may prefer not to work in the private sector, which is highly competitive and efficiency-driven. Women, being more risk-averse, may avoid such competitive environments (Gneezy et al., 2003; Booth et al., 2019).

Supply-side: Women opted out of labor force due to income gains of husbands. To test the supply-side channel, we restrict the sample to married couples within the middle-aged and older cohorts, defined based on the age of the wives. We conduct a heterogeneous analysis by the husbands' educational attainment and present the effects of SOE reform on wives' employment, husbands' earnings, and total household income. The results are presented in Table 6.

Our analysis shows that the negative impact on wives' employment is more pronounced when husbands have some college education. Among families where husbands have education levels above college, the effect on women's employment is negative but not statistically significant. Conversely, in families with husbands who have lower educational attainment, the effect is small but positive. This provides some suggestive evidence that women may have exited the labor market due to household specialization, as their husbands appeared to benefit from privatization. This is reflected in the positive—albeit statistically insignificant—effects on husbands' earnings and total household income. While we do not observe significant differences between families with highly educated and less educated husbands, there is a clear gap in the average earnings, with higher

[32] We include two-year college in the "some college education" group.

means seen in families with more educated husbands.

Supply-side: Women opted out of labor force due to reduced public child care provision. The SOE reform also led to the closure of childcare facilities previously provided by SOEs, driven by increasing pressure for efficiency. The loss of these services likely had a negative impact on women with young children.

Although we do not have direct data on childcare facility closures, we provide indirect evidence using data on newly opened kindergartens from the 2008 Economic Census. We aggregate the number of new kindergartens by prefecture and year of opening and conduct a DiD analysis at the prefecture-year level, following the approach of the prior analysis. As shown in Table 7, prefectures more exposed to the reform experienced a slower increase in new kindergartens. This effect is primarily driven by private kindergartens, as the public sector largely ceased providing childcare services. Private options are more expensive than public ones. The slower growth in private kindergartens may reflect lower demand for childcare in more affected areas, as women may have opted out of the labor force.

We further provide supply-side evidence by exploring the heterogeneous impact of the SOE reform based on the age of the youngest child in the household for the older cohort. Under traditional gender norms, women typically shoulder more childcare responsibilities. Consequently, women may reduce their labor supply if their children were young. Our observations indicate that women with younger children were more negatively affected by the reform.

We present the results in Table 8. We identify a more prominent gender differential effect for households with at least one child below 13 years old. This age range aligns with the youngest age at which children typically enter middle school. Despite the relatively constrained sample size, approximately 4,000 individuals, with children below 13 years old, we discern that the prevailing gender gap is predominantly attributable to such group. The results persist in the outcome of SOE employment, overall employment, earnings, and early retirement. This means females with younger children faced more challenges, whether it be lay-offs or seeking new employment. This supports the supply-side evidence that women may have voluntarily left the labor force to take care of their children.

This finding implies that the downsizing of the public sector harms women more with younger children. It also sheds light on the motherhood penalty, wherein mothers with younger children face a heightened likelihood of involuntary job termination and encounter increased challenges in securing subsequent employment. Our observation aligns with extant literature on job displacement in other countries' contexts, including Angelov et al. (2016); Kuziemko et al. (2018); Kleven et al. (2019a,b).

6.5 Repercussions: Deteriorating Gender Role Attitudes

Over the four decades leading up to the reform, gender role attitude in China underwent a profound transformation. Mao Zedong's ideology, encapsulated in the phrase "Women hold up half the sky", emphasized absolute gender equality, resulting in high levels of female labor force participation. However, following the reform, these attitudes underwent a dramatic shift. The SOE reform symbolized the end of a special era when women were vigorously protected by the government in the labor market.

Figure A13 depicts the trend in the global Gender Inequality Index (GII) computed by the United Nations.[33] In contrast to the relatively stable trend observed in other developed countries, China experienced a notable increase in gender inequality alongside its development trajectory. This trend mirrors findings from existing literature documenting gender disparities in the labor market (Gustafsson and Li, 2000; Li et al., 2006; Zhang et al., 2008; Liu, 2011; Chi and Li, 2014; Liu and Zuo, 2023). This section aims to empirically investigate the hypothesis attributing this trend to the SOE reform.

Using data from China's Women Social Status Survey and World Value Survey in 1990 and 2000, we examine the influence of the SOE reform on traditional gender role attitudes. A primary limitation of these surveys is the absence of prefecture-level information, restricting our analysis to provincial-level variations. To address this, we incorporate provincial-level prereform employment data from the China Labor Statistical Yearbook, defined similarly to the prefecture-level data and normalized by the non-agricultural population aged 15-64, to capture geographical differences. Leveraging temporal changes after 1997, we employ a diff-in-diff regression model to assess shifts in gender role attitudes.

We present outcomes concerning women's decision-making power within the household from China's Women Social Status Survey in Table 9. The respondents are all married women, and the outcomes cover their participation in decisions related to household production, housing choices, expenditure allocation, financial investments, and child-rearing practices. The results show a decline in women's influence in these areas, providing suggestive evidence that the SOE reform had repercussions on traditional gender role attitudes.

We also provide supplementary results from the World Value Survey, though the sample size is smaller and includes both men and women. Using a triple-difference analysis, we examine whether women increasingly adhered to traditional gender norms. Table A6 includes attitudes toward statements like "Men should come first in the event of job loss," "Marriage is outdated," "A woman as

[33]The Gender Inequality Index (GII) is from United Nation's Human Development Report (https://hdr.undp.org/data-center/thematic-composite-indices/gender-inequality-index/indicies/GII). GII is a composite metric of gender inequality using three dimensions: reproductive health, empowerment and the labour market. A low GII value indicates low inequality between women and men, and vice-versa. In terms of labor market, we provide a comparison between China and the U.S. in Figure A14.

a single parent is acceptable," and "Children should be raised by both parents." The results suggest that in provinces more affected by the SOE reform, women were more likely to believe they were disadvantaged in the labor market and should take on greater household responsibilities.

6.6 Robustness Checks

In this section, we conduct a series of robustness checks for our main results. First, we address the concerns of non-randomness of privatization. Second, we discuss potential confounding policies that could bias our results. Third, we used an alternative data source, CHARLS, to verify the results on marriage and fertility. Lastly, we address potential issues related to log zeros (Chen and Roth, 2024) and continuous treatment in Diff-in-Diff analyses (Callaway et al., 2024).

Confounding Economic Indicators in 1992 In Figure 5, we illustrate that some 1992 economic indicators, including *FDI/GDP*, *GDP per capita*, and *Electricity per capita*, are significantly and negatively correlated with the two prereform employment shares at the prefecture level. This suggests that more developed areas were less affected by the reform. Since the privatization did not occur randomly, our double-difference analysis results may be biased. But since our main focus is gender differential impact, it is reasonable to believe that the results are not biased.

Nevertheless, we interact the indicators with the post and female indicators and control in the triple-diff analysis. We interact the indicators with the post indicator and control in the double-diff analysis. We show the results for the older, middle-aged, and younger cohort in Table A9, A10, and A11. They are consistent with the main results.

One Child Policy and Biased Sex Ratio The first possible confounding policy that may drive the years of education and marriage results in younger cohort is the OCP. The OCP was enforced in China from 1979 to 2015, aimed to curb population growth by limiting most couples to having only one child. Many existing studies have found that this policy has contributed to China's extremely unbalanced sex ratio (Li et al., 2011). And sex ratio may vary differently across different regions due to the regional variations in the intensity of son preference. As a result, this may affect the marriage outcomes (Huang et al., 2023). In addition, it is also possible that the decrease in family size resulted from the OCP will cause parents to invest more in children's education, consistent with the prediction of quantity-quality trade-off theory (Li and Zhang, 2017; Huang et al., 2021).

We conduct two sets of analysis to show that our results are not driven by this policy. First, using the population census of 1982 and 1990, we show in Table A7 that the sex ratio is not correlated with our exposure measures. Therefore, the biased sex ratio does not confound our main results. Second, following the existing literature, we use the measure of province-level average

fertility fines from 1979 to 1986, as a proxy for the implementation of the One Child Policy (OCP) (Huang et al., 2021).[34] We interact this measure with the post and gender indicators and control for it in the regression (Equation 4). As shown in Table A8, the results for the younger cohort remain consistent with the baseline regression results.

College Expansion from 1999 Onward China has expanded the yearly quota of newly admitted college students more than seven times since 1999. This threat is particularly pertinent to our analysis of the younger cohort, given that they made education investment decisions during the reform period. Although the college expansion is gender-neutral, young girls could benefit more because they start from a lower level of educational attainment.

First, we argue that the expansion does not confound our analysis because the effect is evident at both the college and high school levels, as shown in Table A5. To further mitigate the concerns, we then add a prefecture-year fixed effect in our baseline analysis (Equation 4) to incorporate the time-varying college admission in different regions. We present the results in Figure A27. The results are similar to the baseline findings. Third, we interact the prefecture-year level number of college students with the gender indicator and include this control in the triple-diff regression. As shown in Table A8, the results remain largely unchanged.

Accession to the WTO in 2001 Many papers (Erten and Leight, 2021; Dai et al., 2021; Khanna et al., 2023) show that China's accession to the WTO in 2001 has signifiant positive effect on household income. Moreover, Wang et al. (2022) show that it increases women's employment. Thus, our results could be underestimated if the prefecture's WTO exposure in 2001 is positively correlated with its SOE reform exposure in 1997.

To address the concern, we follow Erten and Leight (2021) and Khanna et al. (2023) and use the gap between Normal Trade Relations (NTR) tariffs and non-NTR tariffs to measure the trade shock[35]. Also, we use the 2-digit employment share from the 1990 census to create a shift-share measure for each prefecture. We interact this measure with the post and gender dummy variables and include them in the regressions as a robustness check. As shown in Table A8, adding this control does not affect our point estimate.

Migration A challenge to the regional approach of this paper is that labor may migrate across regions in response to the reform. If so, such migration may change the composition of the local

[34] Higher fines indicate stronger enforcement. A map of this measure is shown in Figure A20.

[35] Before 2001, regular Congressional approval was required to maintain low NTR tariffs on Chinese imports. Failure to renew would result in a sudden increase in high non-NTR rates. In 2001, the US made NTR tariff rates permanent. Gaps between NTR and non-NTR tariffs across products help measure the reduction in uncertainty following the conferral of permanent NTR (PNTR) rates. See Erten and Leight (2021) and Khanna et al. (2023) for more details.

labor force and affect employment or earnings. This is particularly pertinent to our analysis of younger cohorts, as they could migrate out for college education.

However, migration was very limited during our study period. Using the 2000 Census, we calculate the share of migrant workers to be only 2.3%.[36] The limited migration is resulted from China's strict household registration (*hukou*) system, which legally separates prefectures (Meng, 2012). Access to social services, such as education, health care, and housing, is tied to an individual's *hukou* status. Therefore, urban residents have few incentives to migrate.

Another concern is that if young adults migrate to other areas for colleague education, they will not be included in the household survey. Due to the selective sample issue, our results on college attainment may be biased. But since students are required to stay in the areas where their *hukou* is registered to finish high school. Our results of high school completion will not be biased, as shown in Table A5 and Figure A24.

An Alternative Data Source: CHARLS In this section, we use the panel data, CHARLES, to replicate our analysis and study the impact of SOE reform marriage and fertility of middle-aged and younger cohorts. Since CHARLES only surveyed individuals above 45 years old. Our sample does not include exactly the individuals with the same birth year in UHS. In the end, our analysis incorporates individuals born between 1952 and 1977.

We employ a similar design as shown in Equation 3, but add individual fixed effects to increase the estimation precision. We present the results in Figure A25. Similar to our main findings, we observe a decline in marriage, especially for women in panel (a). In panel (b), we observe a trend towards reduced fertility post-reform, potentially influenced by income shocks and declining job security.[37]

Poisson Regression to Address the Zero Earnings Chen and Roth (2024) argues that average treatment effects for log-like transformations (e.g., log(Y), arcsinh(Y)) should not be interpreted as percentage effects, as they depend on the units of the outcome. To address this issue, we conduct a robustness check using Poisson regression, which handles zero values in earnings outcomes. Results, shown in Table A12, are consistent in sign with our baseline findings. Significant effects on the gender earnings gap remain for the older and middle-aged groups, though the effect size is smaller after the adjustment.

Continuous Treatment in Difference-in-Differences Callaway et al. (2024) examines the Diff-in-Diff approach with continuous treatment, highlighting potential selection bias under the stan-

[36] Migrant workers are defined as those who do not have a local *hukou*.

[37] Xie et al. (2022) find that the SOE reform leads to higher fertility. The difference could result from different strategies and datasets.

dard parallel trends assumption. To address this, they propose a stronger parallel trends condition that limits treatment heterogeneity. Following their method, we test this assumption by aggregating data by gender and cohort at the prefecture-year level. Figure A28 illustrates the relationship between changes in outcomes from 1992 to 2004 and the continuous treatment variable, Prereform SOE Employment Share, for female overall employment, private employment, and years of education, separated by cohort (older, middle-aged, and younger). The linear relationships observed across all three outcomes suggest that the stronger parallel trends assumption holds in our context.

Further, Callaway et al. (2024) caution that average treatment effects may be difficult to interpret under a linear two-way fixed-effects (TWFE) model. Although they propose a non-parametric approach to estimate treatment effects across different treatment intensities, this method requires a balanced panel dataset, whereas our main data are repeated cross-sectional. Aggregating to the prefecture-year level to achieve a balanced panel would result in substantial observation loss and reduced statistical power. To address this, we conduct an alternative analysis using binary treatments instead. Results, displayed in Tables A13–A15, show consistent coefficient signs with our baseline, although the interpretation changes with the shift from continuous to binary treatment.

7 Conclusion

From 1992 to 2004, China experienced a significant surge in gender disparities in both employment and earnings, despite an annual GDP growth rate exceeding 7% (Gustafsson and Li, 2000; Li et al., 2006; Zhang et al., 2008; Liu, 2011; Chi and Li, 2014; Liu and Zuo, 2023). This study highlights the role of public sector employment and examines the effects of China's 1990s SOE reform, which introduced competition to the labor market and led to over 35 million layoffs. By recognizing the distinct trade-offs women face at different life stages, we conduct a life-cycle analysis that reveals how men and women adapted differently to the reform, significantly shaping the gender gap across multiple dimensions.

Our findings indicate that older women were disproportionately affected by layoffs during the reform compared to their male counterparts and faced greater challenges in re-employment. For the middle-aged group, while we observe no overall employment gender gap, women are less likely to work in the private sector than men. Finally, our analysis of the younger cohort shows that girls were less likely to be employed by SOEs. In response to these reduced labor market opportunities, women increased their investment in education more than men, and both genders experienced a delay in marriage.

We attribute the results to both demand and supply-side factors. On the demand side, higher-skilled industries experienced relative expansion, which disadvantaged women in the labor market due to their generally lower educational levels compared to men. This prompted younger women

to invest more in education to improve their competitiveness. On the supply side, two main mechanisms contributed: (1) the closure of public childcare facilities previously provided by SOEs, and (2) women's comparative advantage in specializing in household responsibilities. Lastly, the reform led to worsened traditional gender role attitudes.

The conclusions from our study provide insights into how women at different life stages respond to economic shocks across various contexts, underscoring the need for life-cycle-specific gender equality policies. For instance, early retirement policies disproportionately impacted women due to the discrepancy in retirement ages between men and women. We also emphasize the critical role of job characteristics in public sector employment in fostering and sustaining gender equality. Providing more flexible work options and family-friendly policies is essential for creating gender-equal workplaces. This is particularly crucial in the context of a low fertility environment, especially within the highly competitive settings of Asian countries.

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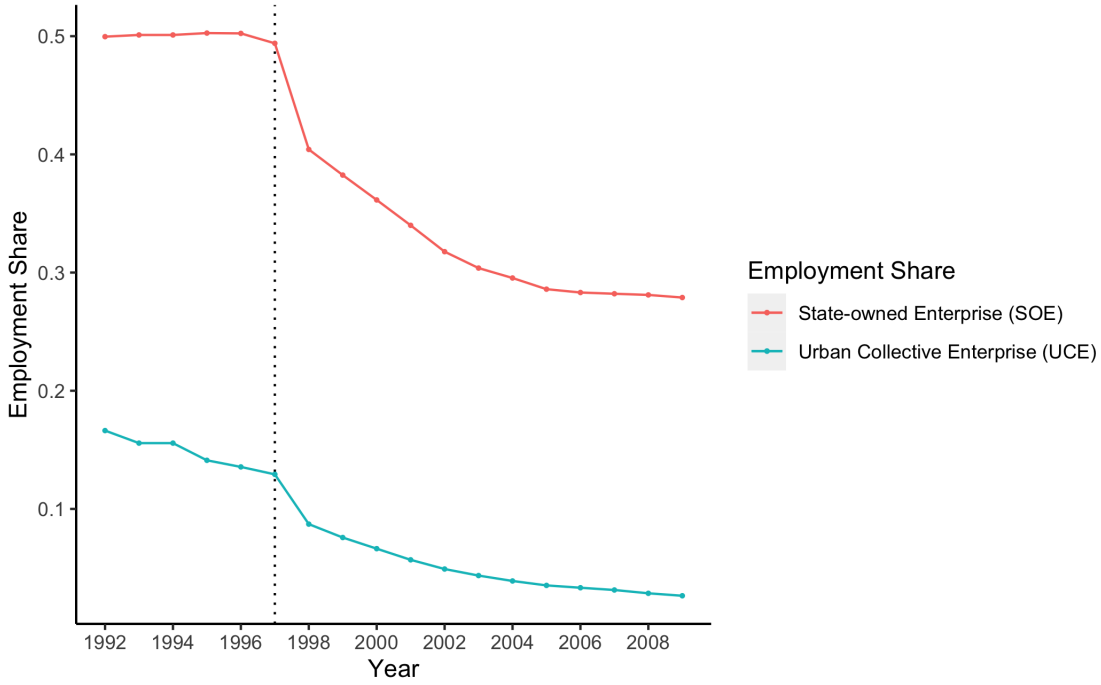
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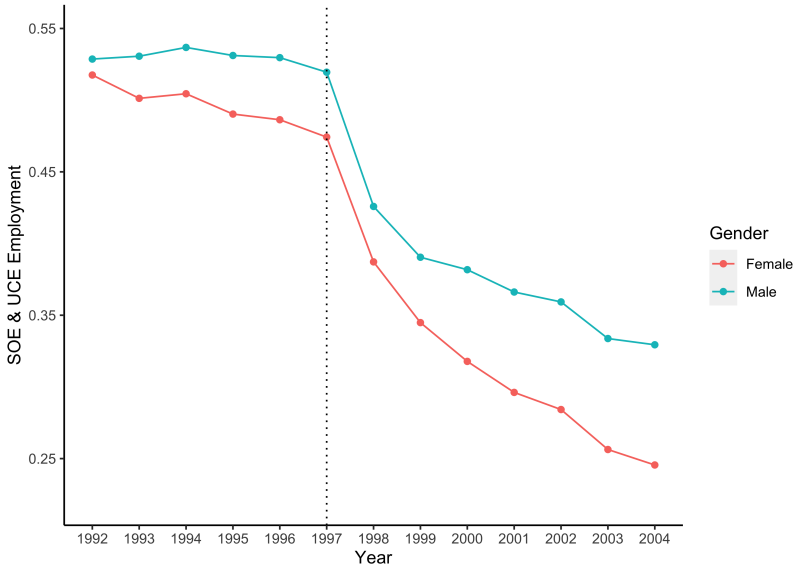
Figures

Figure 1: Share of Urban Labor Force Working in SOEs and UCEs

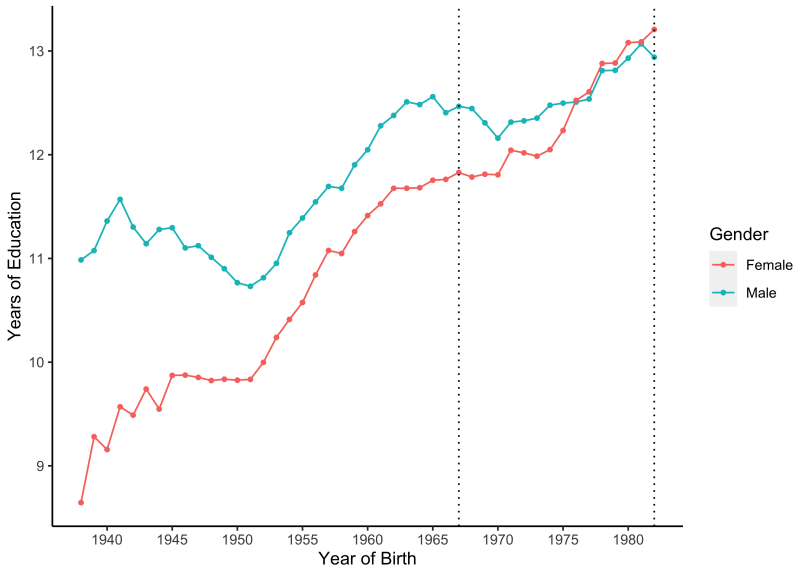


Notes: The figure reports the percent of workers that work in the SOEs from 1988 to 2013 in urban China. The nominator is the employment in each ownership (*Zhi Gong Ren Shu*), and the denominator is the 15-64 non-agriculture population from 2000 census. We add a vertical line for year 1997 when the SOE reform was officially announced by the central government. Employment data comes from China Statistic Yearbook.

Figure 2: Gender Gap Trend in Employment and Education



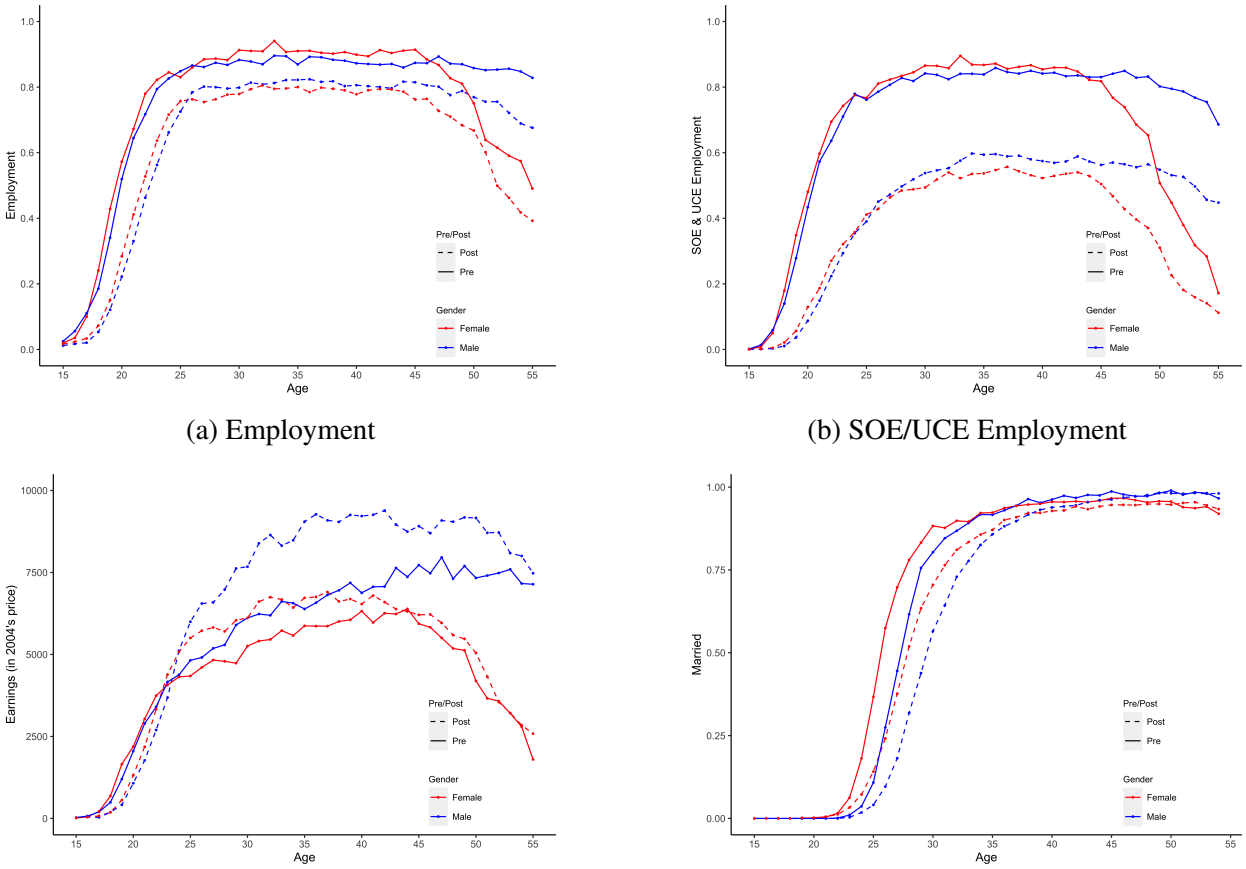
(a) SOE & UCE Employment



(b) Years of Education across Birth Cohorts

Notes: Data comes from Urban Household Survey(1992-2004), reweighted using the method from Section A to correct the oversampling of SOE workers. For panel (a), we restrict the individuals to be age 20-54. We add a vertical line for year 1997 when the SOE reform was officially announced by the central government. For panel (b), we include all the individuals aged 20-54 at the time of survey. We assume all the individuals had concluded their education by then. We highlight the cohort interval 1967-1982, who were 15-30 in the reform year 1997.

Figure 3: Cross-Sectional Profiles for Employment, Earnings, and Marriage Status (1992-2004)



(a) Employment

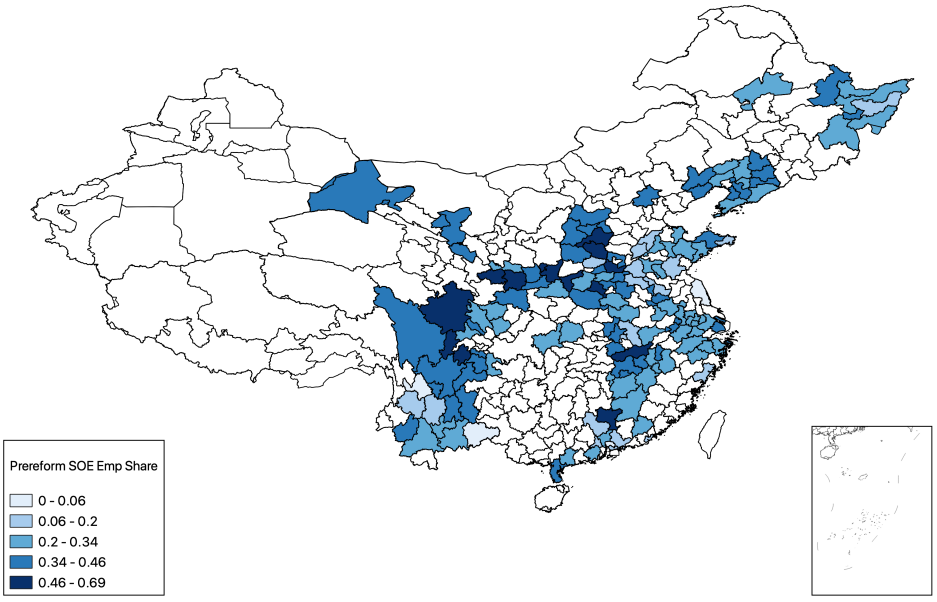
(b) SOE/UCE Employment

(c) Real Earnings

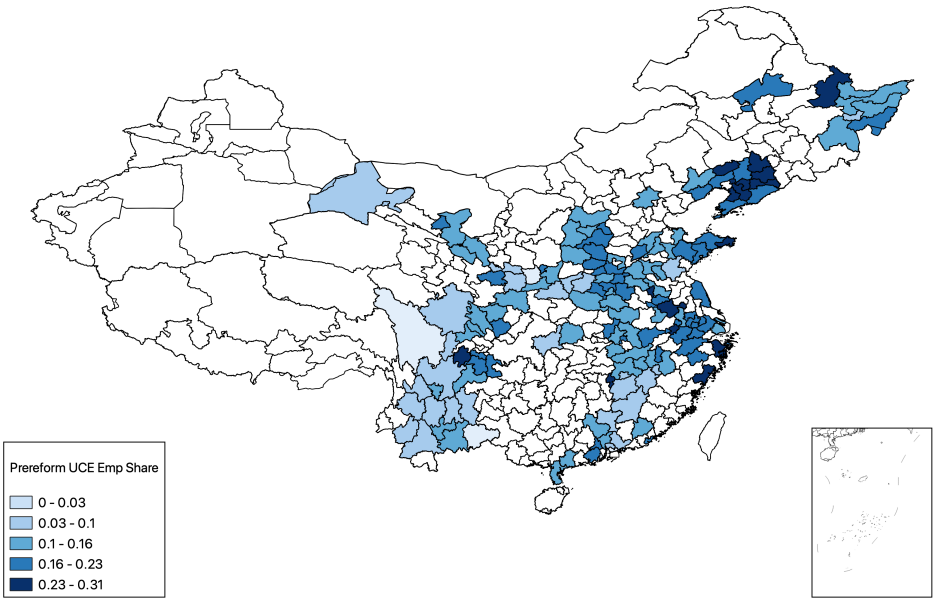
(d) Married

Notes: Data is from the Urban Household Survey (1992-2004), reweighted using the method from Section A to correct the oversampling of SOE workers. We include all the individuals aged 15-54 in all the survey years. We show the significant differences in cross-sectional age profiles in employment, earnings, and marriage across genders before and after the SOE reform. The x-axis represents age, and the y-axis depicts various outcomes. We use blue lines for males and red lines for females; solid lines represent the pre-period, and dotted lines represent the post-period.

Figure 4: Regional Variation in the Exposures to the Reform



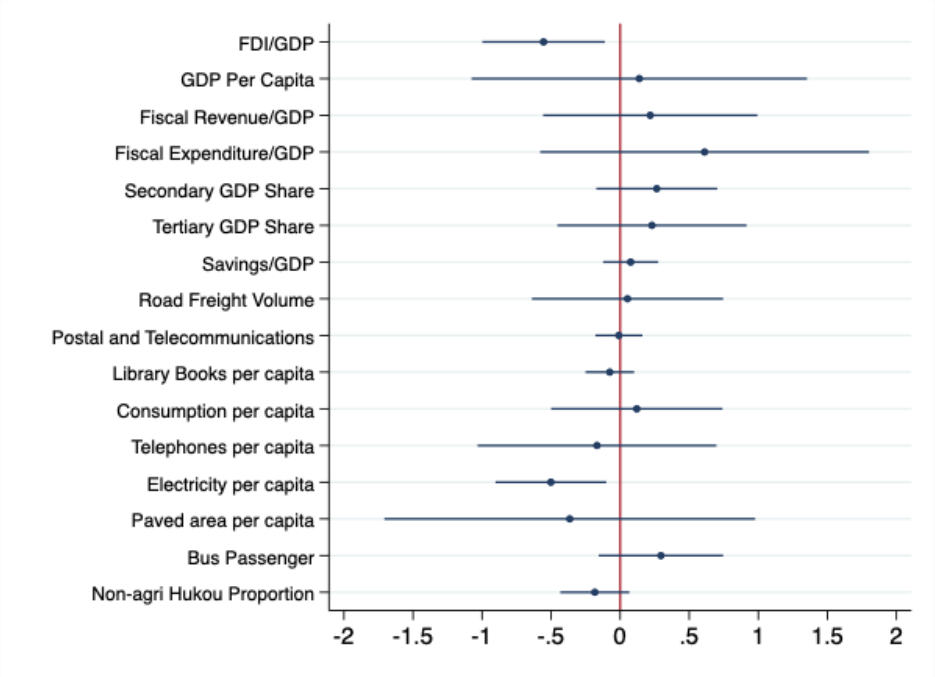
(a) SOE Employment Share in 1992



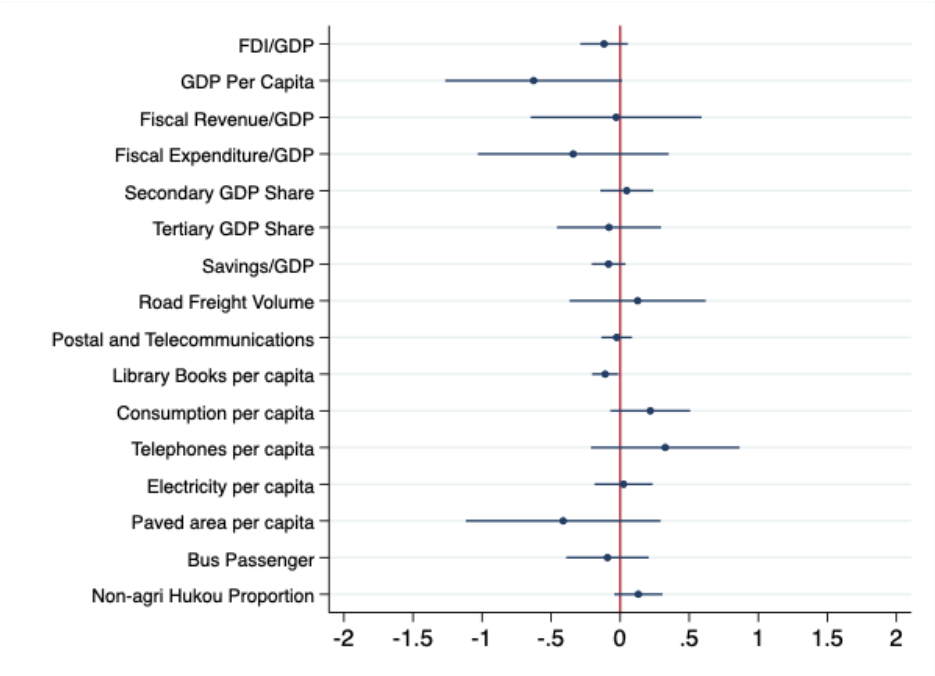
(b) UCE Employment Share in 1992

Notes: This figure depicts the public employment shares (SOE and UCE) in each prefecture from 1992. We use employment data from the Province and City Statistical Yearbook as the numerator. The denominator is the nonagricultural population aged 15 to 64, with data from the 2000 Census. We adjust the prereform shares by industry data from the 1990 Census.

Figure 5: Coefficients of Prereform Economic Indicators on the Treatment Variables



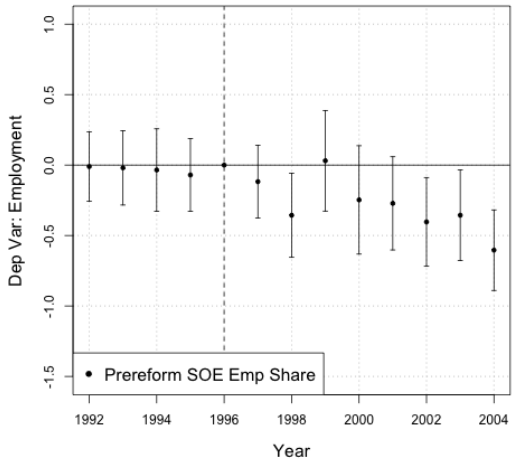
(a) Prereform SOE Employment Share



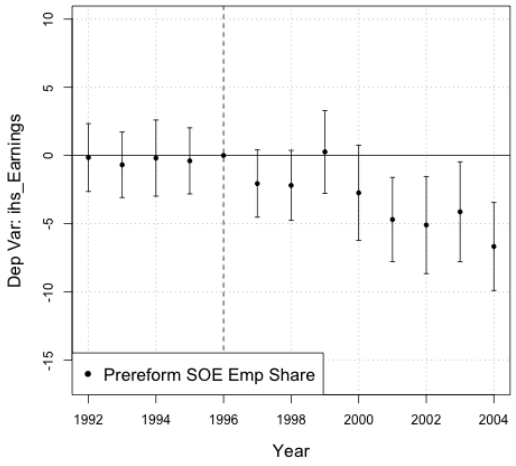
(b) Prereform UCE Employment Share

Notes: Data of the explanatory variables come from China City Statistical Yearbook. The outcome are our geographical treatment variables. Data is at the prefecture level. Some prefectures can't be matched across different Statistical Yearbook, so the sample size (103 prefectures in total) is smaller than the in the baseline regressions. We use 95% confidence interval in the graphs.

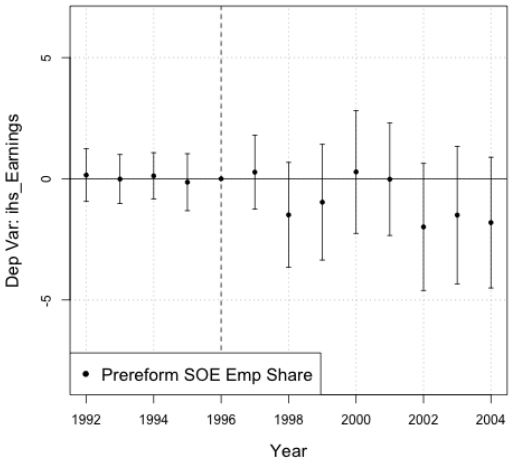
Figure 6: Triple-Diff Event Study Results (coefficients of Prereform SOE Emp Share)



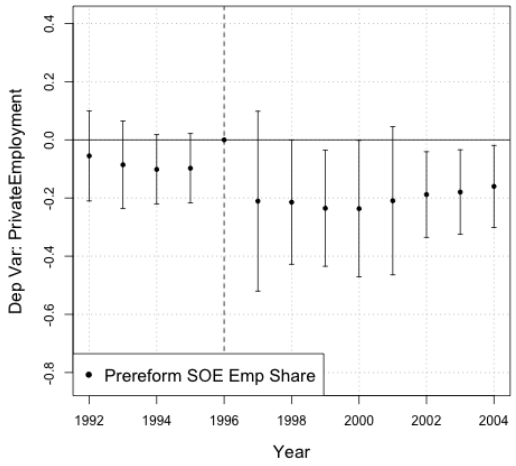
(a) Old Cohort: Employment



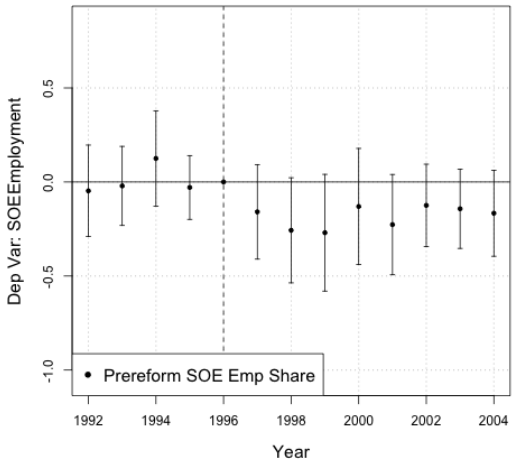
(b) Old Cohort: ihs(Earnings)



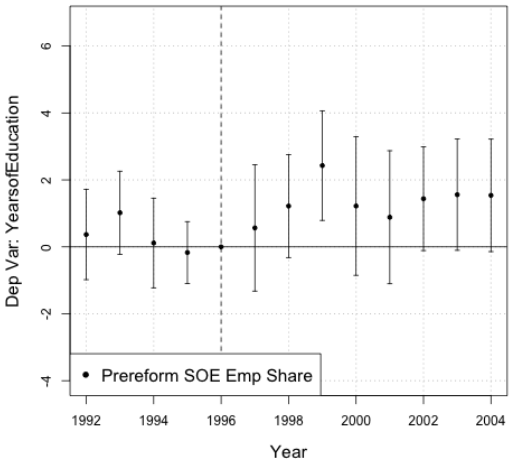
(c) Middle-aged Cohort: ihs(Earnings)



(d) Middle-aged Cohort: Private Employment



(e) Young Cohort: SOE Employment



(f) Young Cohort: Years of Education

Notes: We use the Triple-Diff Event Study Approach to study the effect of SOE reform by gender, as shown in Equation 4 . We utilize the regional variation in the SOE employment share and UCE employment share in 1992 as the geographical treatment. The regressions also include Prereform UCE Emp Share $\times$ post, year-fixed effects, prefecture-gender fixed effects, and age dummies. Robust standard errors are clustered at the prefecture level, and confidence intervals are set at 95%.

Tables

Table 1: Effect of SOE reform on gender inequality, birth cohort 1942-1952

	Women	Men	All	Women	Men	All
Panel A	SOE Employment			Employment		
Prereform SOE Emp Share × Post	-0.538***	-0.149	-0.156	-0.350***	-0.121	-0.098
	(0.102)	(0.194)	(0.204)	(0.109)	(0.086)	(0.089)
Female × Prereform SOE Emp Share × Post			-0.382			-0.270**
			(0.237)			(0.116)
Mean	0.25	0.55	0.40	0.54	0.85	0.70
Panel B	Earnings (IHS)			Retirement		
Prereform SOE Emp Share × Post	-3.551***	-0.851	-0.651	0.271*	-0.009	-0.018
	(0.932)	(1.022)	(1.060)	(0.139)	(0.119)	(0.126)
Female × Prereform SOE Emp Share × Post			-3.102**			0.293*
			(1.318)			(0.176)
Mean	4.81	8.12	6.49	0.44	0.17	0.30
N	31762	32651	64413	31762	32651	64413

Notes: The data source is the UHS 1992-2004. The full sample regressions also include Prereform UCE Emp Share × post, year-fixed effects and prefecture-gender fixed effects. The subsample regressions also include Prereform UCE Emp Share × post, year fixed-effects, and prefecture-fixed effects. All regressions include age dummies. Robust standard errors are clustered at the prefecture level. * significant at 10%, ** significant at 5%, *** significant at 1%.

Table 2: Effect of SOE reform on gender inequality, birth cohort 1952-1967

	Women	Men	All	Women	Men	All
Panel A	SOE Employment			Employment		
Prereform SOE Emp Share × Post	-0.183*	-0.054	-0.042	0.016	0.002	0.015
	(0.105)	(0.149)	(0.149)	(0.105)	(0.149)	(0.149)
Female × Prereform SOE Emp Share × Post			-0.154			-0.053
			(0.147)			(0.062)
Mean	0.51	0.62	0.56	0.89	0.98	0.93
Panel B	Earnings (IHS)			Private Employment		
Prereform SOE Emp Share × Post	0.009	0.777	0.907	-0.104	0.034	0.037
	(0.861)	(0.695)	(0.689)	(0.083)	(0.099)	(0.099)
Female × Prereform SOE Emp Share × Post			-1.018			-0.145***
			(0.812)			(0.054)
Mean	8.19	9.25	8.70	0.04	0.05	0.04
N	74581	70026	144607	74581	70026	144607

Notes: The data source is the UHS 1992-2004. The full sample regressions also include Prereform UCE Emp Share × post, year-fixed effects and prefecture-gender fixed effects. The subsample regressions also include Prereform UCE Emp Share × post, year fixed-effects, and prefecture-fixed effects. All regressions include age dummies. Robust standard errors are clustered at the prefecture level. * significant at 10%, ** significant at 5%, *** significant at 1%.

Table 3: Effect of SOE Reform on Gender Inequality, Birth Cohort 1967-1982

	Women	Men	All	Women	Men	All
Panel A	SOE Employment			Employment		
Prereform SOE Emp Share × Post	-0.083	0.125	0.124	-0.149**	-0.117	-0.117
	(0.094)	(0.100)	(0.103)	(0.068)	(0.073)	(0.075)
Female × Prereform SOE Emp Share × Post			-0.207**			-0.039
			(0.095)			(0.077)
Mean	0.39	0.40	0.40	0.69	0.69	0.69
Panel B	Earnings (IHS)			Private Employment		
Prereform SOE Emp Share × Post	-1.251	-0.425	-0.420	-0.019	-0.060	-0.060
	(0.772)	(0.857)	(0.847)	(0.103)	(0.117)	(0.117)
Female × Prereform SOE Emp Share × Post			-0.888			0.037
			(0.725)			(0.054)
Mean	6.24	6.30	6.27	0.06	0.06	0.06
Panel C	Years of Education			Married		
Prereform SOE Emp Share × Post	0.086	-0.881	-0.807	-0.230***	-0.180	-0.186*
	(0.765)	(0.670)	(0.644)	(0.085)	(0.114)	(0.107)
Female × Prereform SOE Emp Share × Post			0.886*			-0.037
			(0.448)			(0.055)
Mean	11.81	11.99	11.90	0.39	0.29	0.34
N	46427	42658	89085	46429	42659	89088

Notes: The data source is the UHS 1992-2004. The full sample regressions also include Prereform UCE Emp Share × post, year-fixed effects, and prefecture-gender fixed effects. The subsample regressions also include Prereform UCE Emp Share × post, year fixed-effects, and prefecture-fixed effects. All regressions include age dummies. Robust standard errors are clustered at the prefecture level. * significant at 10%, ** significant at 5%, *** significant at 1%.

Table 4: Test the Demand-side Channel

	Δ Education Index		Δ Occupation Index		Δ Female Index	
	(1)	(2)	(3)	(4)	(5)	(6)
Prereform SOE Emp Share	1.597***	1.605***	0.388***	0.400***	0.0337	0.0463
	(0.454)	(0.564)	(0.0793)	(0.101)	(0.0356)	(0.0375)
Prereform UCE Emp Share	1.550*	1.422	0.368***	0.369***	0.0708	0.00292
	(0.886)	(0.906)	(0.121)	(0.129)	(0.0676)	(0.0748)
Observations	157	134	157	134	157	134
Mean	0.356	0.373	0.0212	0.0248	0.00838	0.0136
Add Control		Yes		Yes		Yes

Notes: The data source is the population census in 1990. Data is at the prefecture level. The change in the education index measures the shift in industry composition that requires different level of education in each prefecture before and after the reform. The definition is in Equation 5. The change in the occupation index measures the shift in high-skilled industry composition. The change in the female index represents the shift in historically female-dominated industries. Control variables include working age population, GDP per capita, and FDI/GDP. * significant at 10%, ** significant at 5%, *** significant at 1%.

Table 5: Triple-Diff: Heterogeneous effects of SOE reform on gender inequality (middle and old cohort), by college education

	W/o Any College Education	Some College Education	W/o Any College Education	Some College Education
Panel A	SOE Employment		Employment	
Female × Prereform SOE emp share × Post	-0.282*	0.052	-0.162*	0.024
	(0.153)	(0.206)	(0.083)	(0.092)
Prereform SOE emp share × Post	-0.118	-0.097	-0.098**	0.038
	(0.160)	(0.188)	(0.048)	(0.049)
Female × Post	0.030	-0.021	-0.113***	-0.096**
	(0.061)	(0.089)	(0.036)	(0.041)
p-value	0.15		0.05	
Mean	0.26	0.31	0.83	0.96
Panel B	Earnings (IHS)		Private Employment	
Female × Prereform SOE emp share × Post	-2.393**	-0.197	-0.058	-0.218**
	(0.946)	(0.991)	(0.048)	(0.088)
Prereform SOE emp share × Post	-0.336	0.853	-0.004	0.026
	(0.793)	(0.863)	(0.084)	(0.101)
Female × Post	-0.641	-0.707	-0.007	0.056
	(0.398)	(0.430)	(0.012)	(0.036)
p-value	0.03		0.03	
Mean	7.62	9.54	0.03	0.03
N	245,793	75,298	245,793	75,298

Notes: All regressions also include Female × Prereform UCE Emp Share × post, Prereform UCE Emp Share × post, age dummies, year fixed effects, and prefecture-gender fixed effects. Robust standard errors are clustered at the prefecture level. * significant at 10%, ** significant at 5%, *** significant at 1%.

Table 6: Couple Level Analysis by Husband Education Attainment (middle and old cohort)

	Wife Employment		Husband Earnings (IHS)		Household Earnings (IHS)	
	(1)	(2)	(3)	(4)	(5)	(6)
	Husband w/o College	Husband w/ College	Husband w/o College	Husband w/ College	Husband w/o College	Husband w/ College
Prereform SOE Emp Share ×Post	0.0438	-0.130	0.381	0.369	0.0235	0.0590
	(0.0899)	(0.0882)	(0.564)	(0.248)	(0.469)	(0.175)
Prereform UCE Emp Share ×Post	-0.275	-0.225	-0.905	0.473	-0.265	0.135
	(0.234)	(0.222)	(0.900)	(0.409)	(0.770)	(0.336)
p-value	0.08		0.98		0.98	
Observations	57090	22735	57090	22735	57089	22735
Mean	0.769	0.894	8.028	8.773	8.780	9.418

Notes: The data source is the UHS 1992-2004. We restrict to married households with wife born from 1942 to 1967, corresponding to the middle-aged and the older cohort. The regressions also include year and prefecture fixed effects. All regressions include age dummies. Robust standard errors are clustered at the prefecture level. * significant at 10%, ** significant at 5%, *** significant at 1%.

Table 7: Test the Child Care Channel

	All Kindergarten		SOE/UCE Kindergarten		Private Kindergarten	
	(1)	(2)	(3)	(4)	(5)	(6)
Prereform SOE Emp Share ×Post	-11.54**	-12.27*	0.393	0.226	-11.93**	-12.50*
	(5.762)	(6.416)	(0.836)	(0.977)	(5.753)	(6.349)
Prereform UCE Emp Share ×Post	-1.771	-27.43	3.421	3.564	-5.193	-31.00
	(16.04)	(20.04)	(2.076)	(2.635)	(15.92)	(19.94)
Observations	2041	1729	2041	1729	2041	1729
Mean	10.07	11.29	1.476	1.639	8.594	9.656
Add Control		Yes		Yes		Yes

Notes: The data source is the economic census in 2008. We aggregate the kindergarten numbers by city and the year of foundation. *Post* = 0 if the kindergarten is founded before 1996 and *Post* = 1 if founded after 1996. All regressions also include Prereform UCE Emp Share × after and prefecture fixed effects. Controls include GDP per capita, FDI/GDP and the proportion of age 3-7 in the prefecture. Robust standard errors are clustered at the prefecture level. * significant at 10%, ** significant at 5%, *** significant at 1%.

Table 8: Triple-Diff: Heterogeneous effects of SOE reform on gender inequality (old cohort), by children in the household

	Children under age 13	No children under age 13	Children under age 13	No children under age 13
Panel A	SOE Employment		Employment	
Female × Prereform Emp Share × Post	-0.370	-0.398*	-0.637	-0.250**
	(0.411)	(0.230)	(0.421)	(0.125)
Prereform Emp Share × Post	0.167	-0.154	-0.058	-0.137
	(0.367)	(0.193)	(0.268)	(0.100)
Female × Post	-0.145	-0.025	0.025	-0.187***
	(0.191)	(0.073)	(0.215)	(0.045)
p-value	0.98		0.32	
Mean	0.42	0.40	0.71	0.69
Panel B	Earnings (IHS)		Early Retirement	
Female × Prereform Emp Share × Post	-5.858	-2.866**	0.468	0.274
	(3.645)	(1.439)	(0.373)	(0.172)
Prereform Emp Share × Post	-1.340	-1.020	0.212	0.002
	(2.569)	(1.167)	(0.242)	(0.136)
Female × Post	0.152	-1.664***	0.025	0.089
	(1.627)	(0.492)	(0.179)	(0.078)
Mean	6.55	6.48	0.26	0.31
p-value	0.41		0.50	
N	4,152	60,261	4,152	60,261

Notes: All regressions also include Female × Prereform UCE Emp Share × post, Prereform UCE Emp Share × post, age dummies, year fixed effects, and prefecture-gender fixed effects. Robust standard errors are clustered at the prefecture level. * significant at 10%, ** significant at 5%, *** significant at 1%.

Table 9: Effects on Gender Role Attitude: Females' Decision Participation at Home

	(1) Production	(2) Housing	(3) Expense	(4) Capital	(5) Finance	(6) Children
Prereform SOE Emp Share ×Post	-0.213	-0.509***	-0.448***	-0.323*	-0.983***	-0.396***
	(0.293)	(0.158)	(0.109)	(0.187)	(0.343)	(0.0931)
Post	-0.0707	-0.0556	0.0932**	-0.203**	0.0224	-0.0510
	(0.0630)	(0.0783)	(0.0345)	(0.0811)	(0.109)	(0.0499)
Observations	29257	34243	38985	36316	23887	31283
Mean	0.634	0.657	0.772	0.707	0.604	0.758

Notes: The data source is the Women Status Survey in 1990 and 2000. The outcomes are all binary, meaning that whether women participate household decision from each aspect. Prereform SOE Emp Share is the provincial-level layoff rate provided by China Labor Statistical Yearbook. The definition is the same as the city level. $Post = 0$ if the survey is conducted before 1996 and $Post = 1$ if conducted after 1996. We include the province and year of birth FEs. We cluster the standard error at the provincial level. We weight the regression according to 1990 population in each province. * significant at 10%, ** significant at 5%, *** significant at 1%.

Appendix

Appendix A Data: Weight

A.1 Weight by Ownership Type

As Ge and Yang (2014) and Feng and Guo (2021) mentioned in their papers, the UHS is known to overweight SOE workers. This occurs for three potential reasons. First, self-reporting may introduce error. For example, when an SOE is restructured and becomes a stock-holding firm or a joint venture, its employees may continue to classify their employer as an SOE, failing to recognize the change in ownership type for some time. Second, SOE workers usually work an eight-hour day and thus may have more free time in which to respond to surveys than their private sector counterparts. Third, the China National Bureau of Statistics relies on employers to persuade workers to participate in the surveys to reduce the nonresponse rate.

We examine the trend of public employment share (including government, SOE[A1], and collective employment) for each prefecture from the UHS data and present the results. While we observe a sharp decline in public employment share for most prefectures during the reform period of 1996–2000, we also find abnormalities in some prefectures, such as those in Henan and Hubei, two provinces that have been most affected by the reform according to previous studies (Lee, 2000). We provide the comparison of the public employment share of Henan across the Statistical Yearbook data and the UHS data in Figure A1. Interestingly, the UHS data shows a steady or even increasing trend of public sector employment in these prefectures, providing evidence of a sampling issue in the UHS data.

We also refer to other data sources to confirm the problem.

First, we examine the trend of public employment share using data from the statistical yearbook of each prefecture. The statistical yearbook is an authoritative source of economic indicators coded by the statistical bureau of each prefecture. Figure 1 shows the trend of public employment share in most prefectures, indicating a sharp decrease during the reform period of 1996 to 2000. Furthermore, we note that the most significant declines occurred in 1998, the year following the national announcement in 1997. By comparing the public employment share data from the UHS and the statistical yearbook, we find a significant discrepancy, further implying a sampling issue in the UHS data.

Next, we refer to the China Labor Statistical Yearbook coded by CNBS. It provides data at the provincial level. In Figure A18, we display two data sources: the share of SOE sector layoffs for

[A1] We are not able to separate governmental and SOE employment in our data sources, the statistical yearbook of each province and city.

each province from 1998 to 2000 and the change in public employment share for each province from 1996 to 2000. Both graphs are consistent with the treatment intensity proxy as described above.

Based on the evidence presented above, we conclude that there is a need to address the representativeness issue in the UHS data. To achieve this, we propose adjusting the weight of each observation. While Ge and Yang (2014) utilize a resampling approach to address this issue, we propose reweighting the employment by ownership type to make more efficient use of the UHS data.

We compare the shares of different types of employment (namely SOE employment, collective employment, and other employment) between the statistical yearbook and the UHS for each prefecture-year. We define the the variable $Weight_emp_{ict}$ in Equation A1.

$$Weight_emp_{ict} = \begin{cases} \dfrac{\text{Prereform SOE \& Gov Emp Share}_{yearbook}}{\text{Prereform SOE \& Gov Emp Share}_{UHS}} & \text{For Gov \& SOE worker i} \\ \dfrac{\text{Prereform UCE Emp}_{yearbook}}{\text{Prereform UCE Emp Share}_{UHS}} & \text{For UCE worker i} \\ \dfrac{1-\text{Public Share}_{yearbook}}{1-\text{Public Share}_{UHS}} & \text{For nonpublic (non-Gov, SOE or UCE) worker i} \end{cases} \tag{A1}$$

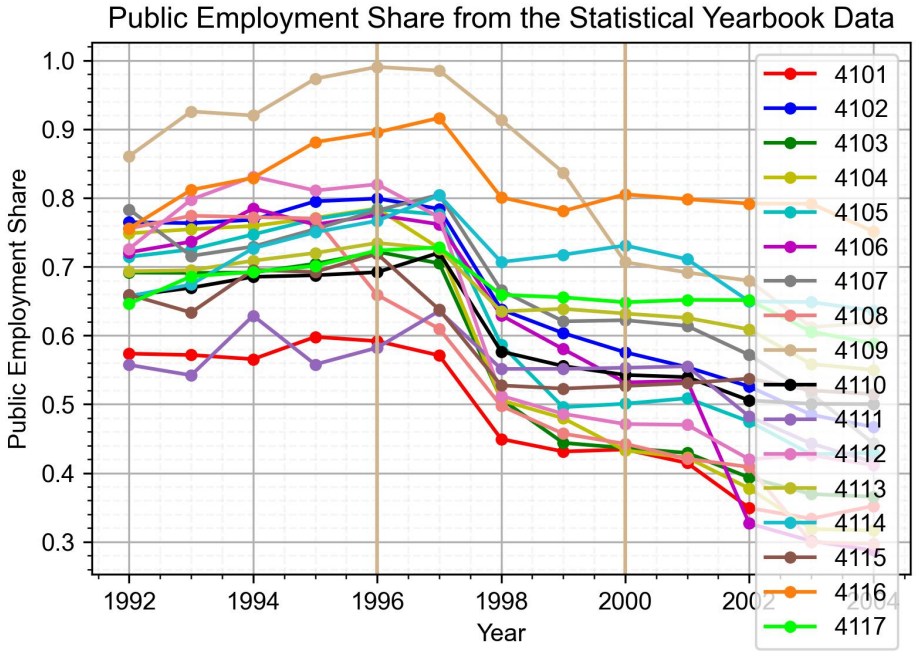
Another notable issue with the UHS dataset is the tripled sample size following the 2002 reform, which creates a need to downweight observations after 2002 to account for the potential bias in the data. To address this issue, we create a new variable $Weight_year_{ict}$ that measures the change in population before and after the reform in each prefecture. By comparing the mean population before and after 2002, we calculate a weight ratio that is applied to adjust for the year-level discrepancy, as presented in Equation A2. As noted by Dai et al. (2021), the UHS sample size for each prefecture is proportionate to their population, so we don't need to weight the sample according to the population.

$$Weight_year_{ict} = \begin{cases} 1 & t < 2002 \\ \dfrac{\text{Average Sample Size Before 2002}_{ict}}{\text{Average Sample Size After 2002}_{ict}} & t \geq 2002 \end{cases} \tag{A2}$$

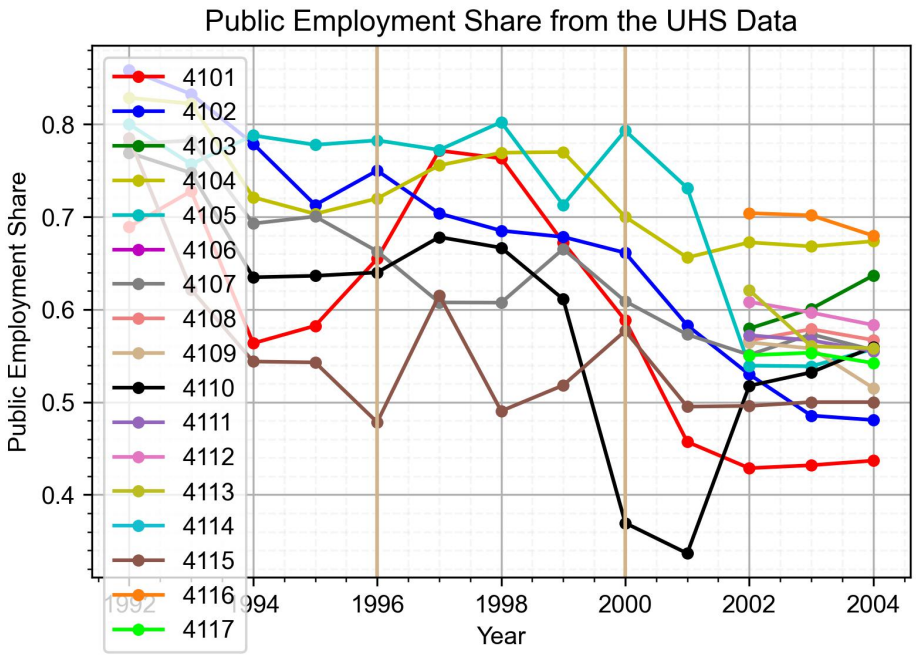
We multiply the two weights and use as our weighting index $Weight_{ict}$, as shown in Equation A3.

$$Weight_{ict} = Weight_emp_{ict} \times Weight_year_{ict} \tag{A3}$$

Figure A1: Compare the Public Employment Share Trend in Henan across UHS and Statistical Yearbook



(a) Data from Statistical Yearbook



(b) Data from UHS

Notes: The legend represents each city code from Henan. Some cities in Henan only show up after 2002 in the UHS. Public employment includes government, SOE, and collective enterprise. We divde the public employment by non-agriculture population for age 15-64.

A.2 Verify the Weighting Approach using the *Reduction in Public Employment*

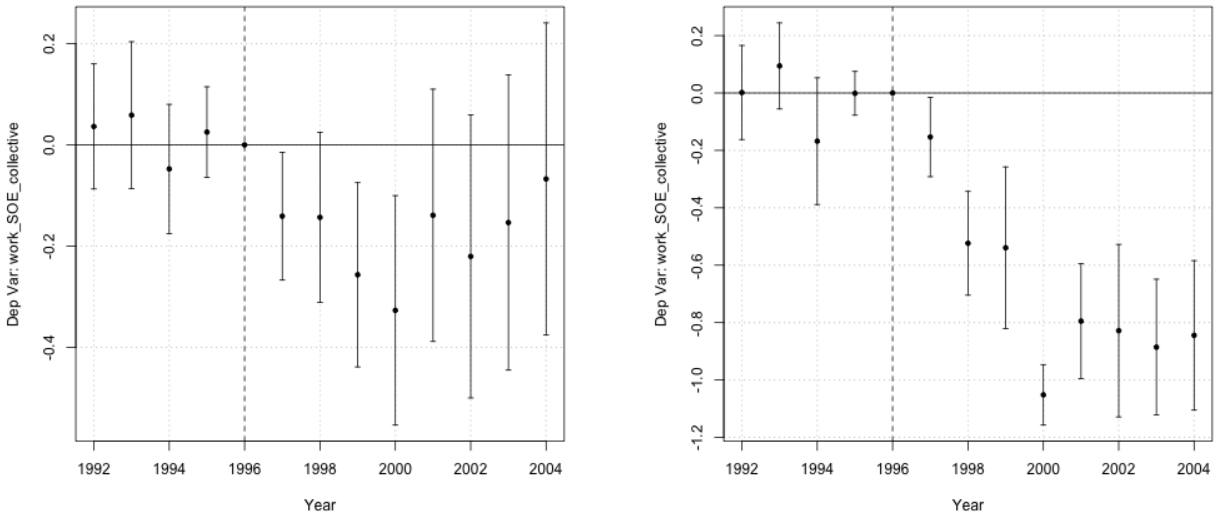
Is our weighting approach valid? To answer this question, we conduct an event study to correlate the *Reduction in Public Employment* with the individual's probability of working in the public sector. If our measurement of *Reduction in Public Employment* is reliable, which relies on the data that comes from the statistical yearbook, the point estimate should be around -1 in year 2000. The reason is simple. Mechanically, if the change in public employment share went from 100% in 1996 to 0 in 2000, we should observe that the probability for any workers to work for any public sector is 0. In other words, as the outcome variable *Work in Public Sector* is a stock variable, a coefficient of -1 at year 2000 implies that public employment has completely diminished compared to the base year 1996.

The specific event study regression design is as follows:

$$\begin{aligned}\text{Work in Public Sector}_{ipt} = \alpha + \sum_{k \geq 1992, k \neq 1996}^{2004} \beta_k \times \text{Reduction in Public Employment}_p \times \mathbb{1}\{t == k\} \\ + \Phi X_{ipt} + \delta_p + \gamma_t + \varepsilon_{ipt} \end{aligned} \tag{A4}$$

We present a comparison between the event study with and without our weighting approach, as illustrated in Figure A2. Our findings indicate that without the use of weighting, the coefficient at year 2000 is -0.2. This suggests that the UHS data fails to accurately capture the public sector employment reported by the statistical yearbook data. The reason for this disparity is that certain prefectures oversample SOE employees, thereby failing to reflect the contracting public sector, as discussed in detail in Section A. In contrast, when we apply our weighting strategy, the coefficient at year 2000 is -1. This confirms the mechanical accuracy of our weighting approach and provides evidence that it successfully addresses UHS's sampling issue. Therefore, we use our weighting strategy for all analyses in this paper.

Figure A2: Validity of the Weighting Approach: Effect on Employment in the Public Sector



(a) Without Weighting and Control Variables

(b) Without Control Variables

Notes: We regress the variable Employment in Public Sector to check the validity of our weighting approach. We use the regional variation in change of the public employment share from 1996 to 2000 as the reform intensity. In (a), we use the DiD Event Study Approach without any weighting and control variables. In (b), we use the DiD Event Study Approach with weighting but without control variables. We show that the weighting strategy is successful in correcting the oversampling of SOE workers.

Appendix B Data: Marriage Outcome Inference

The UHS doesn't provide outcomes on marriage status before 2002, so we infer this information according to the each person's relationship with the household lead. We outline the algorithm as below.

We first classify household members into three generations, the household lead generation, the parent generation, and the children generation. Couples can show up in all of the three generations. For the household generation, we assume the household is married if and only if his/her spouse appears in the survey. For the parents' generation, we assume the member is married if and only if we observe one female and one male in the generation. Inference is harder for the children's generation as we can't distinguish sibling or couple according to the survey question. We make a strong assumption that if only one male and one female above 24 appear in the children's generation, they are married couple.

We acknowledge that we can make both Type I (married inferred as unmarried) and Type II (unmarried inferred as married) error in our inference. In order to check the error rate, we compare the inferred status and the true status provided in the survey after 2002. We provide the error rate in Table A1. We find that the error is the lowest when we assume the age limit to be 24 for the younger generation. The total error rate is as low as 2.7%, making our analysis more credible.

Table A1: Error Rate in the Inferred Marriage Status

Age	Unmarried inferred as married	Married inferred as unmarried	Total
21	0.9365%	1.93%	2.873 %
22	0.8391%	1.966%	2.805%
23	0.7016%	2.036%	2.737 %
24	0.5658%	2.152%	2.718%
25	0.369%	2.35%	2.754%
26	0.2787%	2.65%	2.93%

Appendix C Validate the Exposures

Reduction in the Public Sector Employment To validate our two reform exposures, we take advantage of the key feature of the SOE reform, which resulted in a massive layoff that varies across regions. Ideally, we would like to know the exact number of laid-off workers across ownerships in each year by regions, however, such data is not available. Instead, we utilize the reduction in the regional public employment share from 1996 to 2000 to validate our two pre-reform exposures. To be specific, the *Reduction in Public Employment* is calculated as shown in Equation A5.

$$\text{Reduction in Public Employment}_p = \frac{\text{Public Employment}_{p,1996}}{\text{Working-age Population}} - \frac{\text{Public Employment}_{p,2000}}{\text{Working-age Population}} \tag{A5}$$

Figure 4 and A16 show the regional variations in pre-SOE share, pre-UCE share and the *Reduction in Public Employment*. We observe significant variations in all these three measures. For example, the northeast of China experienced a sharp decline in the employment in the public sectors during the reform. And these are the areas with high pre-SOEs and pre-UCEs employment shares.

Do Prereform Employment shares really predict the *Reduction in Public Employment*? In this part, we validate that both the Prereform SOE Employment Share and Prereform UCE Employment Share are positively correlated with the *Reduction in Public Employment*.

For this analysis, we use the full sample of prefectures. Our primary focus is on the prereform employment shares of different types of public ownership, such as government, SOEs, and UCEs. We hypothesized that prefectures with higher Prereform SOE and UCE shares would be more impacted by the reform.

The hypothesis is that the prereform employment share by ownership may predict the reform intensity. It is true that we find that both SOE and UCE share in 1992 positively predict the *Reduction in Public Employment*, as shown in Figure A17. This implies that a higher pre-reform public employment share is positively correlated with the reductions in the public sector. Moreover, we have found that the coefficient of collective enterprise employment share is higher than that of SOE. This finding could be explained by two potential reasons. First, although we observe the biggest decline in employment numbers in the SOE sector, the UCE sector shrank more proportionately during the reform. Hence, this could contribute to a higher coefficient of the Prereform UCE Employment Share in our analysis. Second, UCEs are impacted more during the reform. While SOE are mostly big enterprises, UCEs are much smaller. Following the guidance of *zhuada fangxiao* ("grasping the big, enlivening the small"), UCEs are more likely to be shut down or privatized than

SOEs.

Do pre-shares by industry predict the *Reduction in Public Employment*? We further ask whether the pre-reform shares by industry can be good proxies to the reform. This hypothesis relies on the assumption that the reform affects certain industries more than others. Indeed, we discover from the China Labor Statistical Yearbook that the manufacturing and wholesale and restaurant industries experienced the most significant declines during the reform period. We want to determine whether the *Reduction in Public Employment* varies based on the pre-reform employment share in different industries. We use the 1990 census to calculate the employment share by industry. We classified the industries into 13 categories using the 2-digit classification system from the 1990 census. However, when we regress the *Reduction in Public Employment* on these pre-shares by industry, none of them is significant, as shown in Figure A17. It means that although the reform indeed targets on certain industries, the *Reduction in Public Employment* is not correlated with the composition of these industries prior to the reform.[A2] As a result, the pre-reform shares by industry can't be a valid proxy to the reform.

Do pre-determined characteristics correlate with the pre-shares? We leverage the variation in prereform SOE and UCE shares as our identification strategy. In this part, we discuss the correlations of other observed variables with the two prereform-share variables.

In an ideal scenario, we would expect the prereform employment shares would be as good as random. However, this is unlikely in reality. In fact, the SOE reform began in the 1980s, with a focus on property rights, while the labor market remained rigid. Moreover, under the guidance of Deng Xiaoping, China aimed to gradually open up the country to foreign investment and trade. In general, we believe that regions with a more open local economy tend to have a lower share of public employment.

Furthermore, we investigate whether the geographical variation is correlated with other economic indicators before the reform. To do this, we regress the prereform employment shares on prefecture-level economic indicators from 1992. The data for this analysis are sourced from the City Statistical Yearbook.[A3] The regression results are summarized in Figure 5. The figure shows that, while the treatment variables are generally not correlated with most indicators at the 95% confidence level, significant correlations do exist with some indicators, including *FDI/GDP*, *GDP per capita*, and *Electricity per capita*. These indicators are all negatively correlated with the prereform employment shares, as they reflect the openness and development of the economy. This suggests

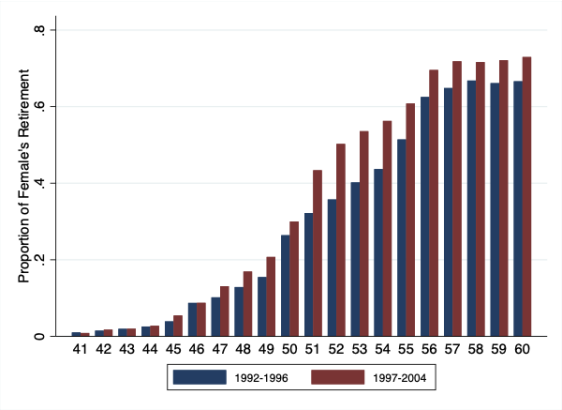
[A2] Since we only have 13 industry categories, our prediction has to be relied on this relatively coarse division. If there were more detailed categories, things may change.

[A3] While it remains the only available source, it suffers from the issue of missing data. Despite this limitation, we believe that the available data still provide valuable insights for our analysis.

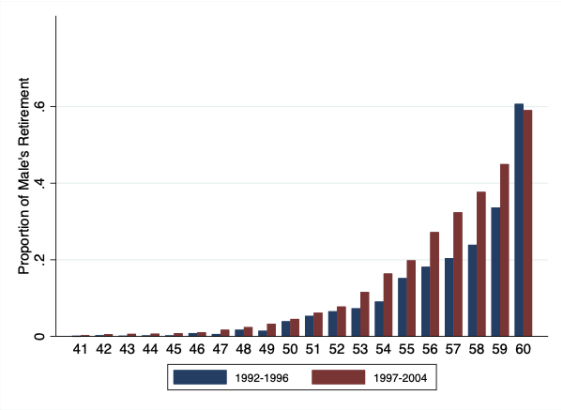
that more developed and open economies were less affected by the reform. We assume that these correlations do not impact our analysis of the gender gap. We control for these indicators in our robustness checks in Section 6.6.

Appendix D Other Figures and Tables

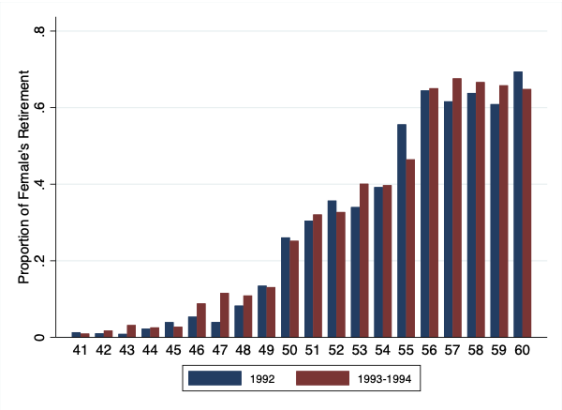
Figure A3: Proportion of Retirement



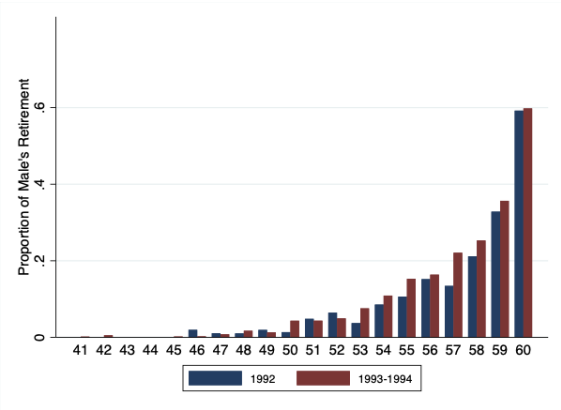
(a) Female Retirement Proportion (1997)



(b) Male Retirement Proportion (1997)



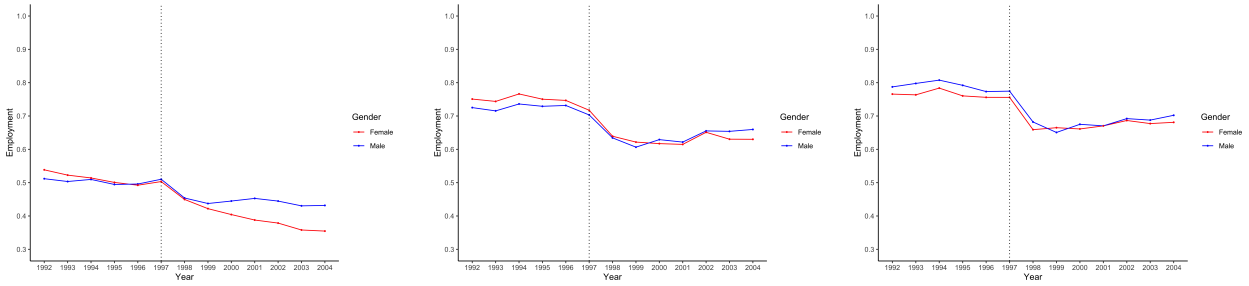
(c) Female Retirement Proportion (1993)



(d) Male Retirement Proportion (1993)

Notes: The data source is the UHS. Panels (a) and (c) show females' retirement proportion at each age, before and after 1997 and 1993. Panels (b) and (d) depict males' retirement proportion at each age, before and after 1997 and 1993. 1997 is the year of the SOE reform, and 1993 is the year when the early retirement policy was introduced.

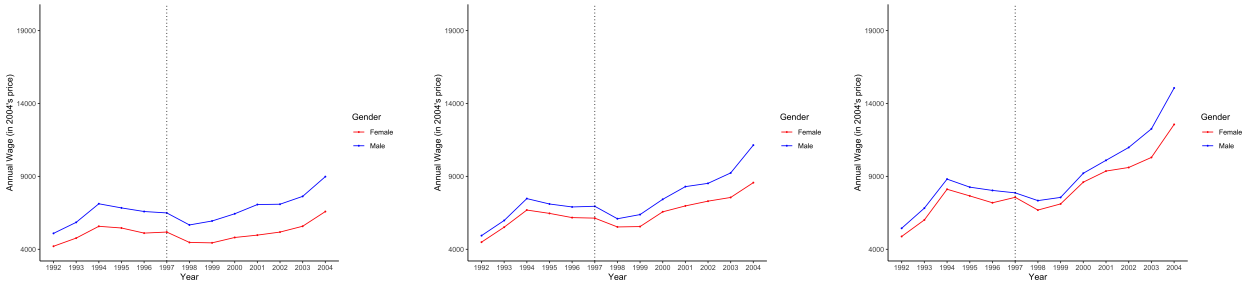
Figure A4: Gender Gap in Employment across Education Attainment



(a) Below High School (b) High School (c) Above High School

Notes: Data comes from Urban Household Survey(1992-2004), reweighted using the method from Section A to correct the oversampling of SOE workers. We restrict the individuals aged 15-54. We add a vertical line for year 1997 when the SOE reform was officially announced by the central government.

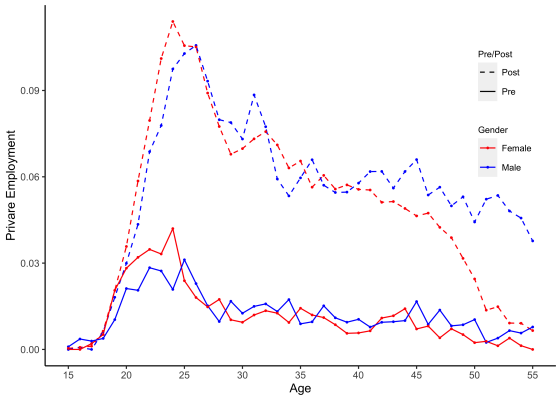
Figure A5: Gender Gap in Wage Income across Education Attainment



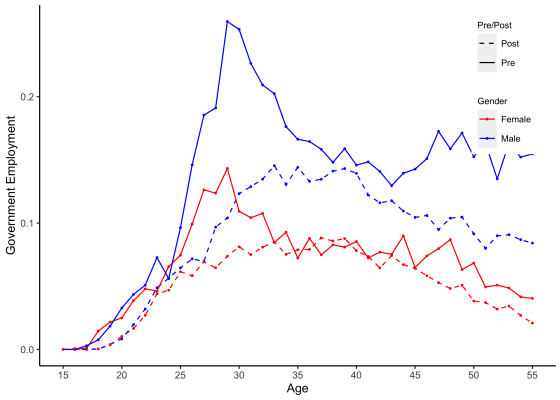
(a) Below High School (b) High School (c) Above High School

Notes: Data comes from Urban Household Survey(1992-2004), reweighted using the method from Section A to correct the oversampling of SOE workers. We restrict the individuals aged 15-54 with positive income. We add a vertical line for year 1997 when the SOE reform was officially announced by the central government.

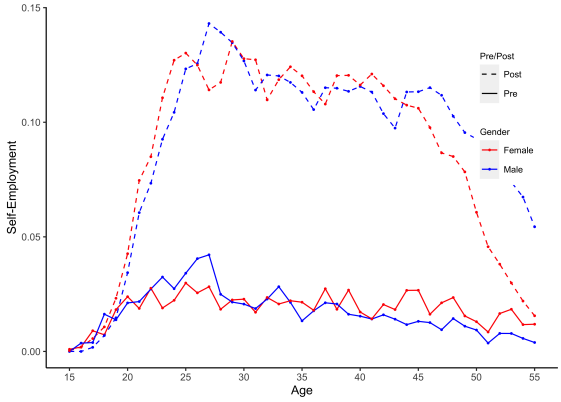
Figure A6: Cross-Sectional Profiles for Employment and Education (1992-2004)



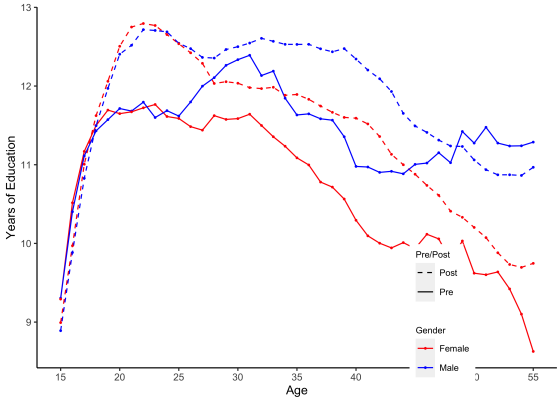
(a) Private Employment



(b) Government Employment



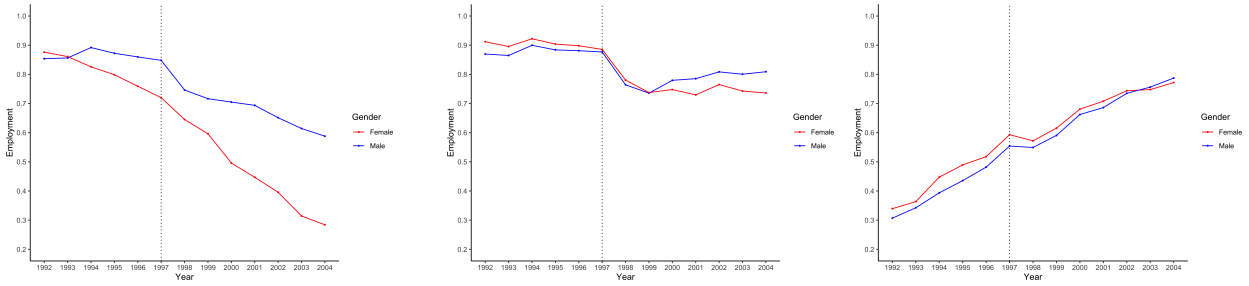
(c) Self-Employment



(d) Years of Education

Notes: Data comes from Urban Household Survey(1992-2004), reweighted using the method from Section A to correct the oversampling of SOE workers. We include all the individuals aged 15-54 in all the survey years (1992-2004). We plot four groups in each graph against age. Pre denotes prereform period (1992-1996). Post denotes postreform period (1997-2004).

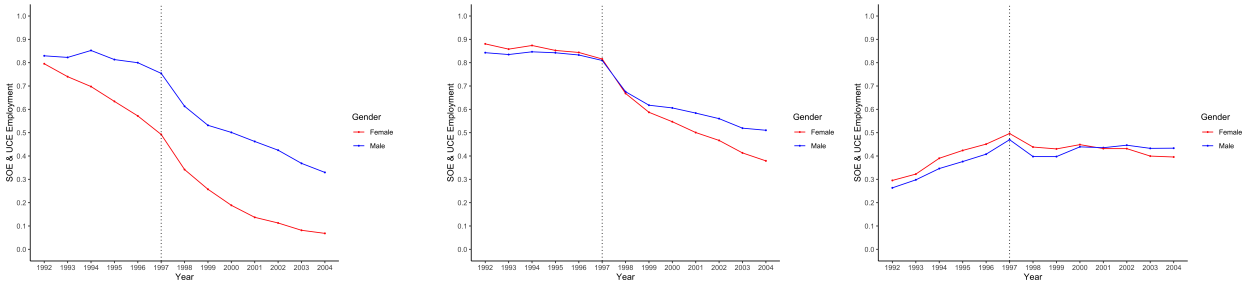
Figure A7: Trend of Employment across Birth Cohorts



(a) Old Cohort (b) Middle-aged Cohort (c) Young Cohort

Notes: Data comes from the Urban Household Survey (1992-2004), reweighted using the method from Section A to correct the oversampling of SOE workers. We plot the year trend across different cohorts. The old cohort was born between 1942 and 1952. The middle-aged cohort was born between 1952 and 1967. The young cohort was born between 1967 and 1982. We add a vertical line for the year 1997 when the SOE reform was officially announced by the central government.

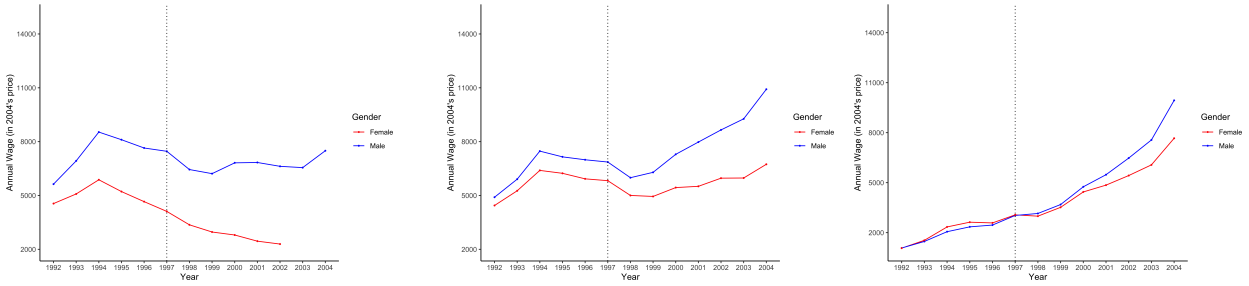
Figure A8: Trend of SOE/UCE Employment across Birth Cohorts



(a) Old Cohort (b) Middle-aged Cohort (c) Young Cohort

Notes: Data comes from the Urban Household Survey (1992-2004), reweighted using the method from Section A to correct the oversampling of SOE workers. We plot the year trend across different cohorts. The old cohort was born between 1942 and 1952. The middle-aged cohort was born between 1952 and 1967. The young cohort was born between 1967 and 1982. We add a vertical line for the year 1997 when the SOE reform was officially announced by the central government.

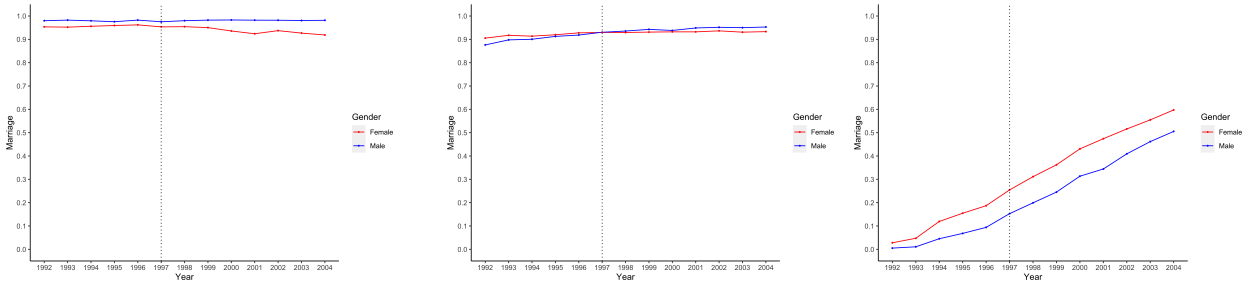
Figure A9: Trend of Wage Income (in 1994's Price) across Birth Cohorts



(a) Old Cohort (b) Middle-aged Cohort (c) Young Cohort

Notes: Data comes from the Urban Household Survey (1992-2004), reweighted using the method from Section A to correct the oversampling of SOE workers. We plot the year trend across different cohorts. The old cohort was born between 1942 and 1952. The middle-aged cohort was born between 1952 and 1967. The young cohort was born between 1967 and 1982. We add a vertical line for the year 1997 when the SOE reform was officially announced by the central government.

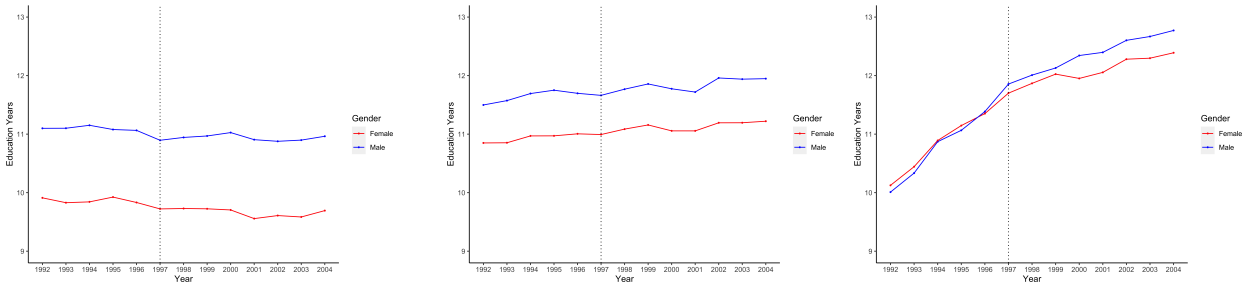
Figure A10: Trend of Marriage Status across Birth Cohorts



(a) Old Cohort (b) Middle-aged Cohort (c) Young Cohort

Notes: Data comes from the Urban Household Survey (1992-2004). We plot the year trend across different cohorts. The old cohort was born between 1942 and 1952. The middle-aged cohort was born between 1952 and 1967. The young cohort was born between 1967 and 1982. We add a vertical line for the year 1997 when the SOE reform was officially announced by the central government.

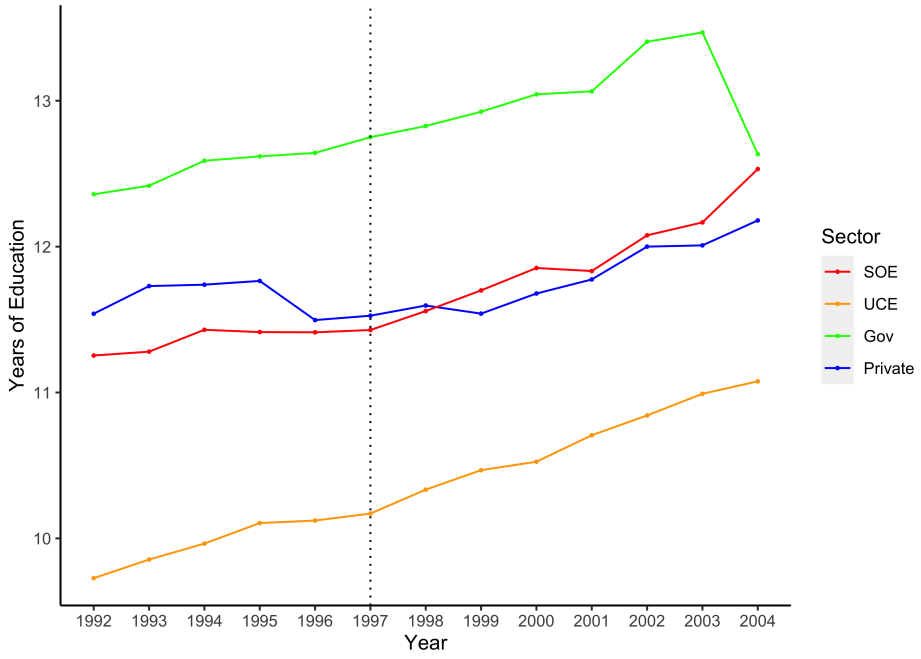
Figure A11: Trend of Years of Education across Birth Cohorts



(a) Old Cohort (b) Middle-aged Cohort (c) Young Cohort

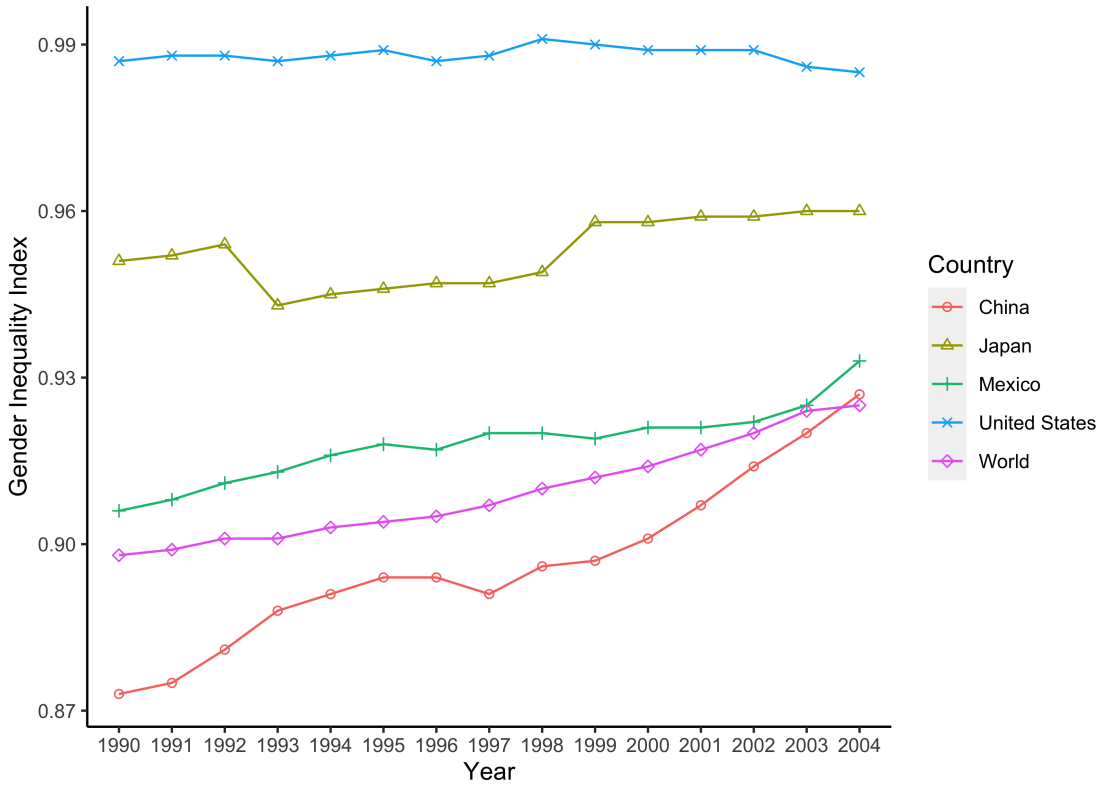
Notes: Data comes from the Urban Household Survey (1992-2004). We plot the year trend across different cohorts. The old cohort was born between 1942 and 1952. The middle-aged cohort was born between 1952 and 1967. The young cohort was born between 1967 and 1982. We add a vertical line for the year 1997 when the SOE reform was officially announced by the central government.

Figure A12: Education Trend by Sector



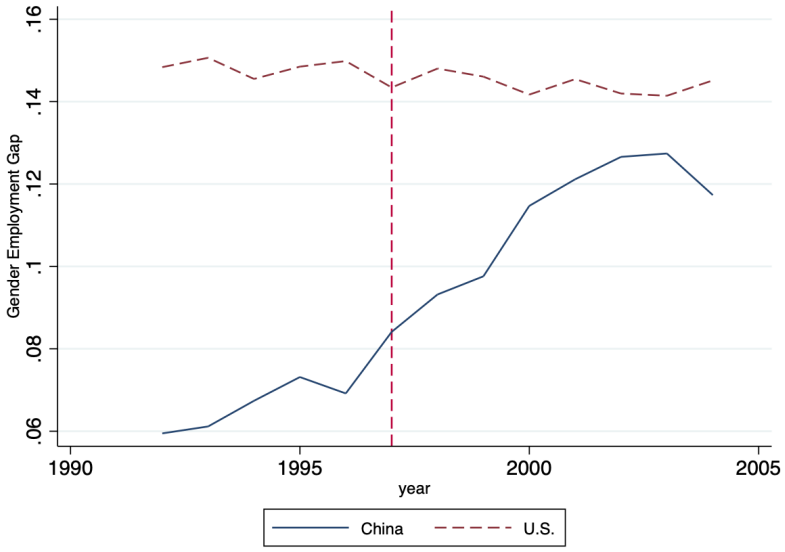
Notes: Data comes from Urban Household Survey(1992-2004). We include all the cohorts in the sample. We add a vertical line for year 1997 when the SOE reform was officially announced by the central government.

Figure A13: Gender Inequality Index (GII) Trend across Countries

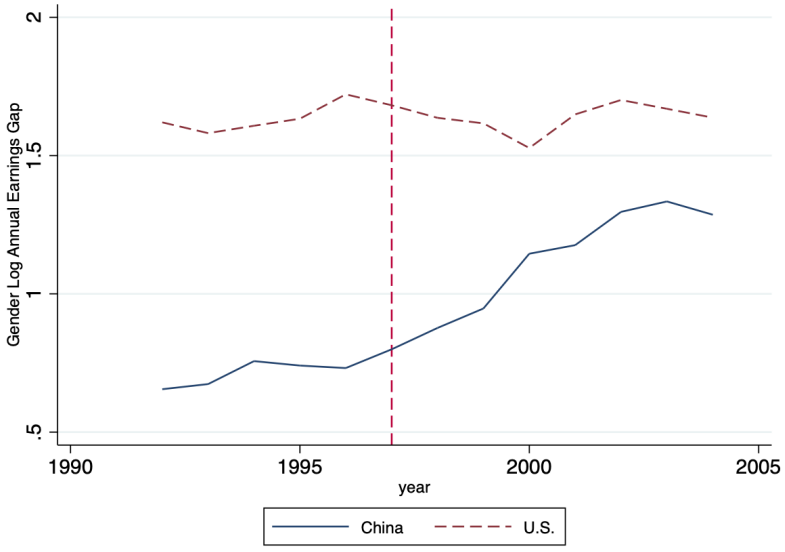


Notes: The data source is the Gender Inequality Index (GII) from United Nation's Human Development Report (https://hdr.undp.org/data-center/thematic-composite-indices/gender-inequality-index/indicies/GII). GII is a composite metric of gender inequality using three dimensions: reproductive health, empowerment and the labour market. A low GII value indicates low inequality between women and men, and vice-versa.

Figure A14: Gender Gap Trend in China and the U.S.



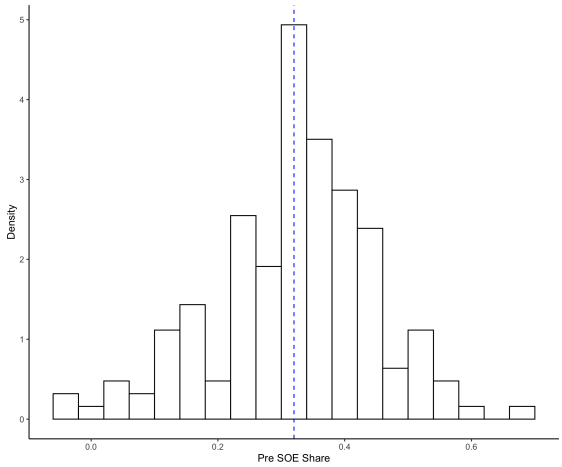
(a) Employment



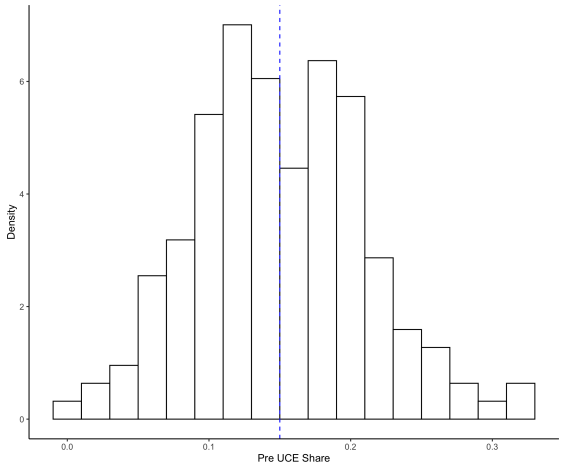
(b) In(Earnings)

Notes: The gender employment gap denotes the difference in employment rate across gender. The gender log annual earnings gap denote the difference of log average annual earnings across genders. China's data comes from Urban Household Survey. U.S.'s data comes from Current Population Survey. We restrict to people aging 20-54 and in the non-agriculture sector to both of the samples. We add a vertical line for year 1997 when the SOE reform was officially announced by the central government.

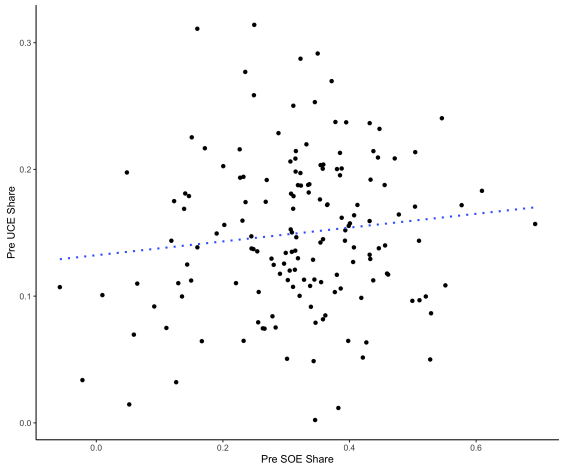
Figure A15: The Histograms of the Two Preshares and their Correlation



(a) Prereform SOE Employment Share Distribution



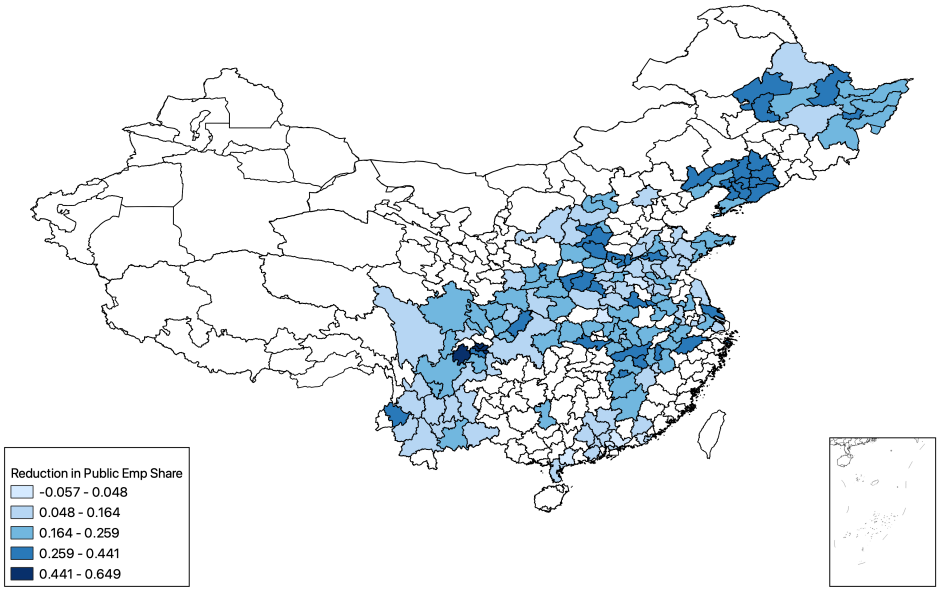
(b) Prereform UCE Employment Share Distribution



(c) Correlation between the Two Preshares

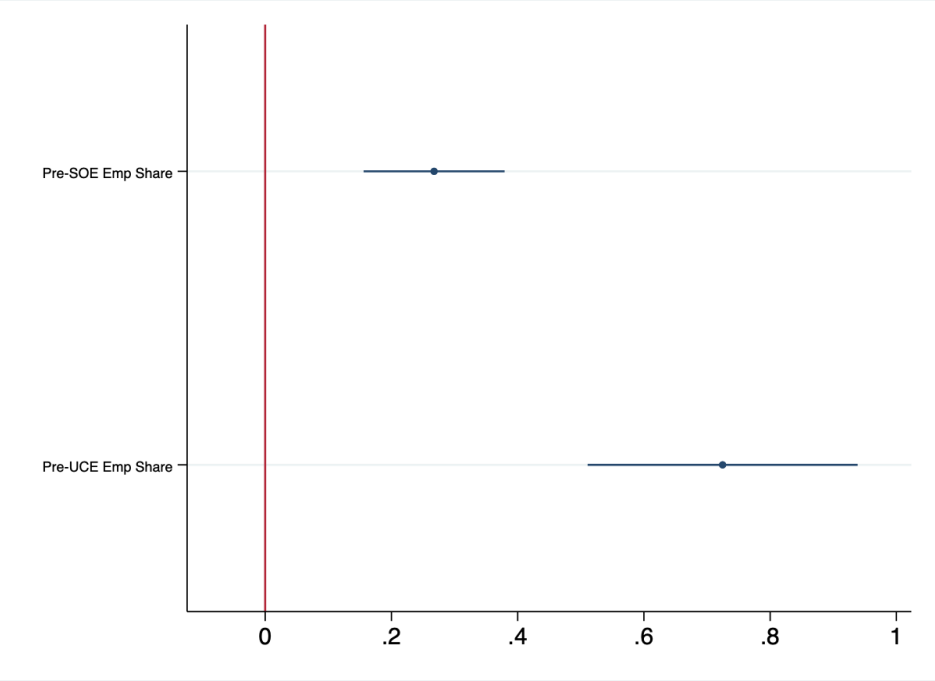
Notes: We use the employment data from the Province and City Statistical Yearbook to be the numerator. The denominator is 15-64 nonagriculture population from 2000 Census. We adjust the preshares by the industry data from the 1990 Census. A tiny proportion of the prereform SOE employment share is negative because of the measurement error across the multiple data sources.

Figure A16: Reduction of Public Employment Share

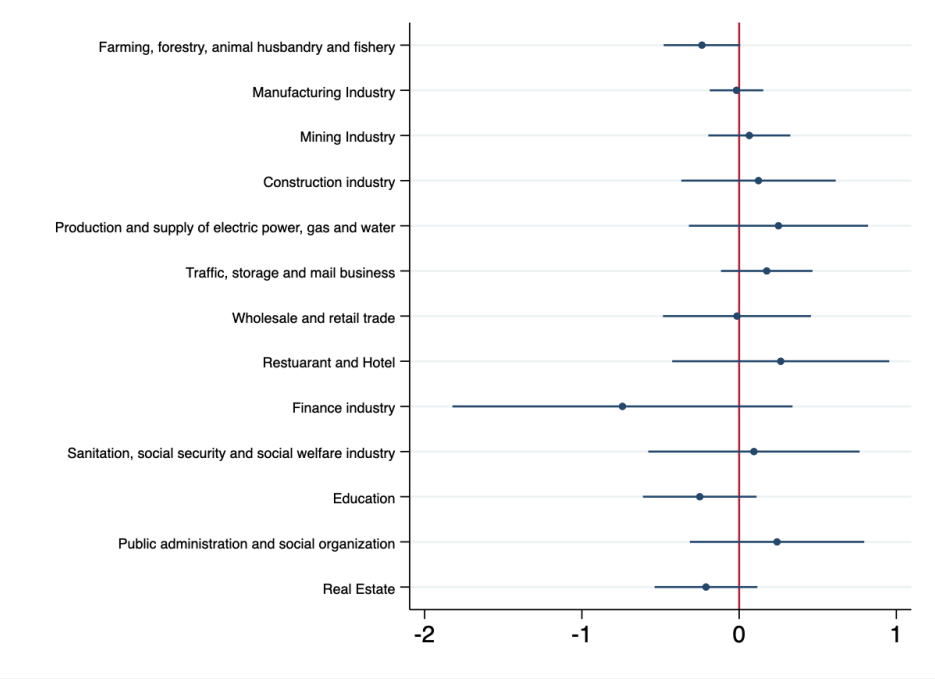


Notes: This figure reports the change of public employment share in each prefecture from 1996 to 2000. Data comes from Statistical Yearbook of each province and prefecture.

Figure A17: Coefficients of the Pre-reform Shares on Reduction of Public Employment Share



(a) Preshares by Sector



(b) Preshares by Industry

Notes: The first figure shows the results of regressing the Reduction of Public Employment Share upon each sector employment share in 1992; the second figure reports the results of regressing the Reduction of Public Employment Share upon each industry employment share in 1990. Employment by industry data comes from Census of 1990. Employment by ownership data comes from Statistical Yearbook of each province and prefectures in 1992.

Figure A18: Provincial Variation in the Layoff Proportion of the Public Sector

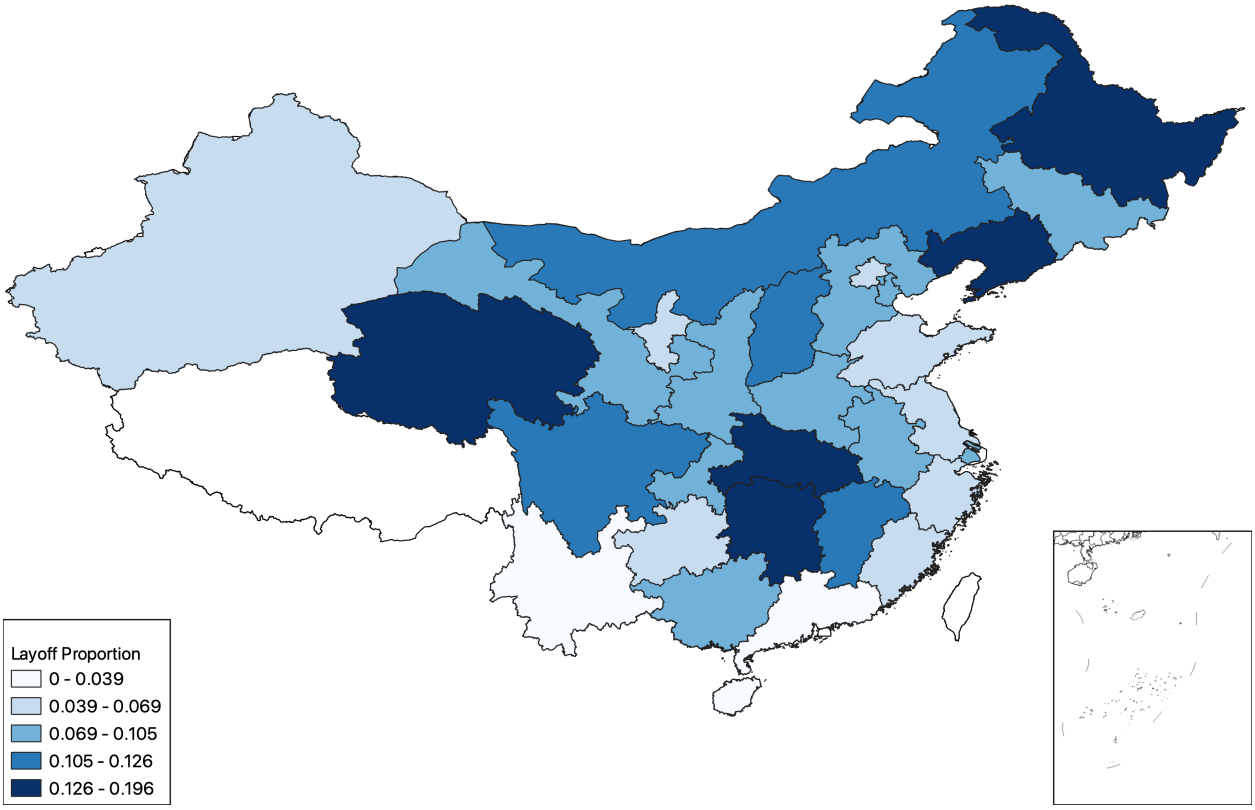
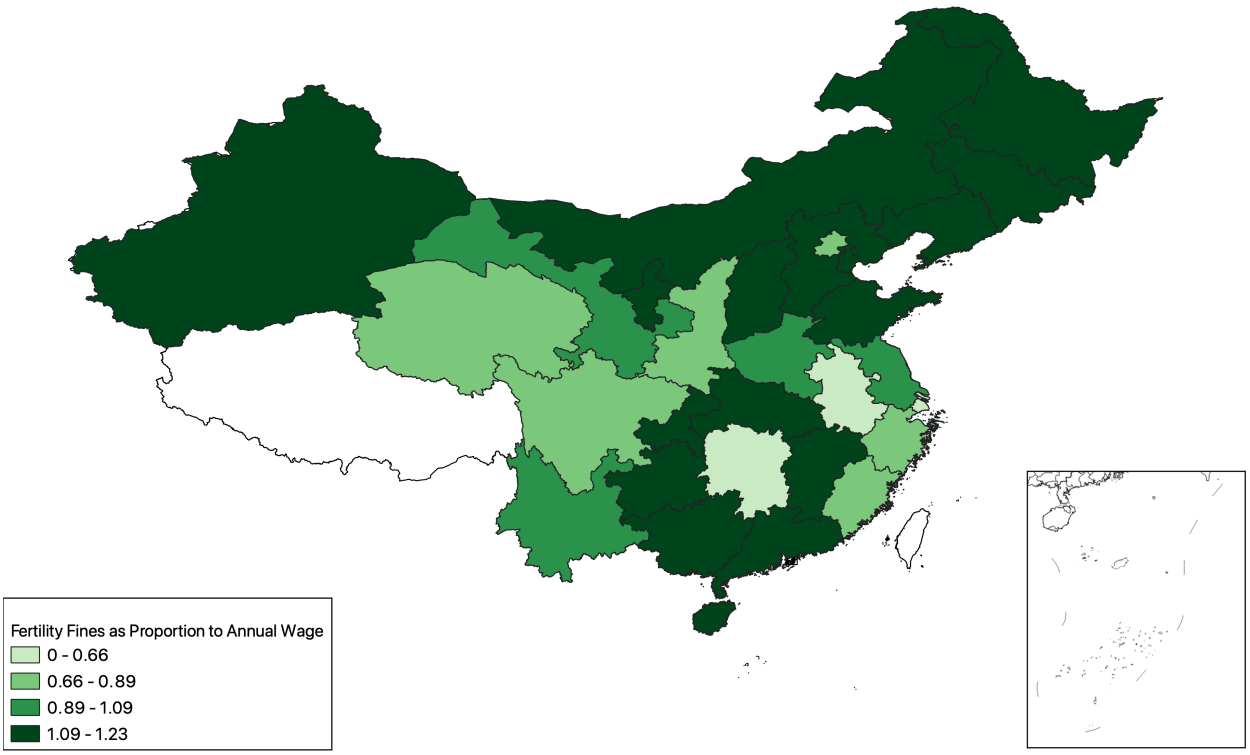


Figure A19: Layoff Proportion

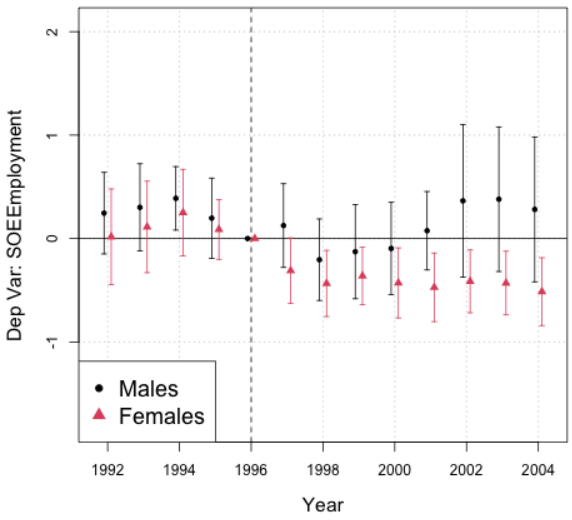
Notes: These figures show the layoff proportion of the Public Sector in each province from 1996 to 2000. Data comes from China Labor Statistical Yearbook.

Figure A20: Provincial Variation in Fertility Fines as Proportion to Annual Income

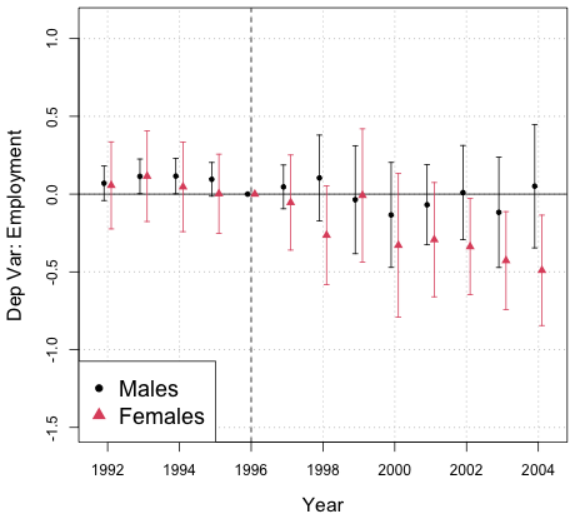


Notes: These figures show the provincial variation in fertility fines as proportion to annual income. The proportion is averaged from 1979 to 1986. We don't have data in Tibet and Taiwan.

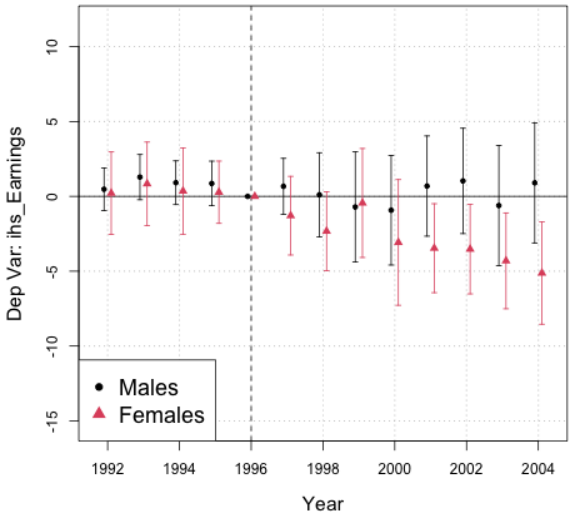
Figure A21: Event Study Results for Birth Cohort 1942-1952 (coefficients of Prereform SOE Emp Share)



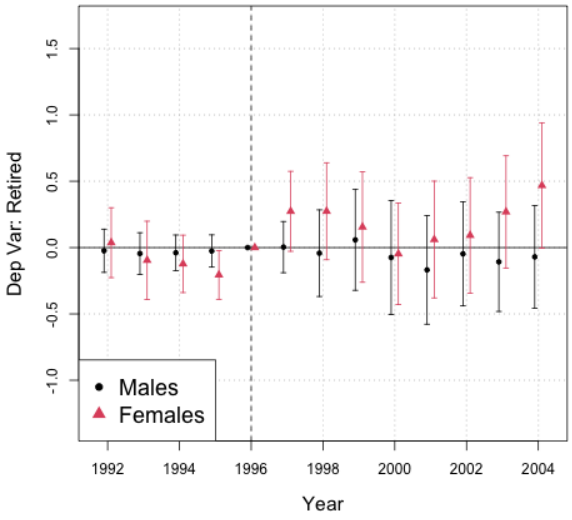
(a) SOE Employment



(b) Employment



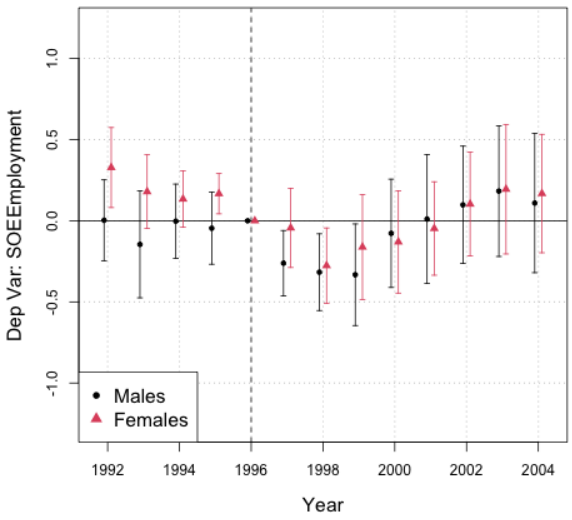
(c) ihs(Earnings)



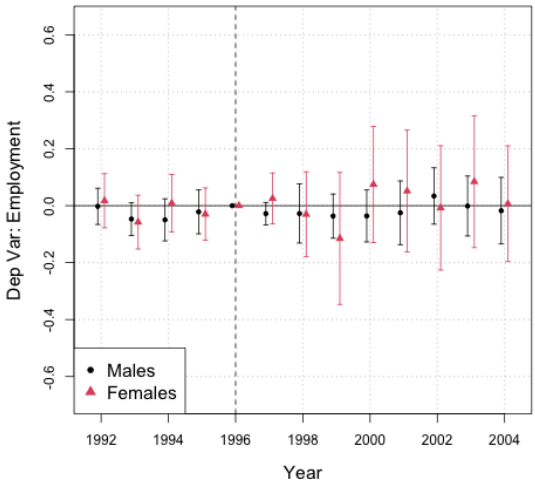
(d) Retirement

Notes: We use the Event Study Approach to study the effect of SOE reform on employment and earnings by gender. We use the regional variation in the SOE employment share and UCE employment share in 1992 as our treatment. We include city and year fixed effect.

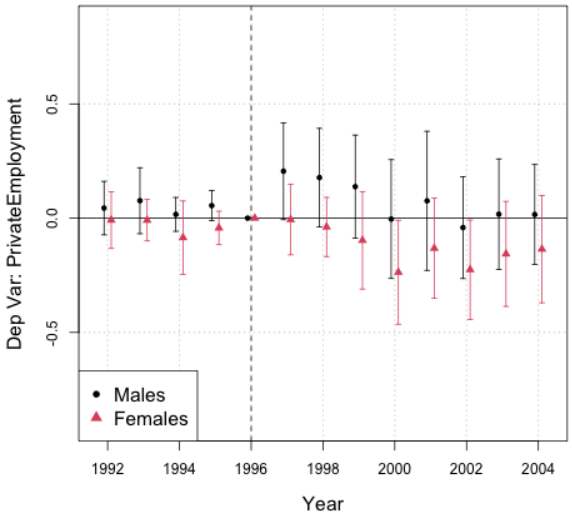
Figure A22: Event Study Results for Birth Cohort 1952-1967 (coefficients of Prereform SOE Emp Share)



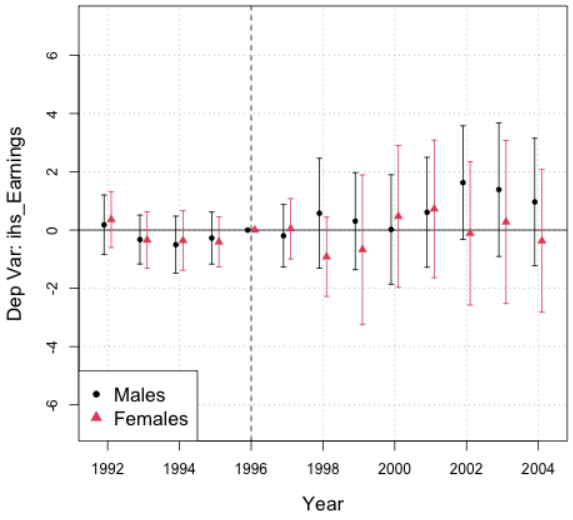
(a) SOE Employment



(b) Employment



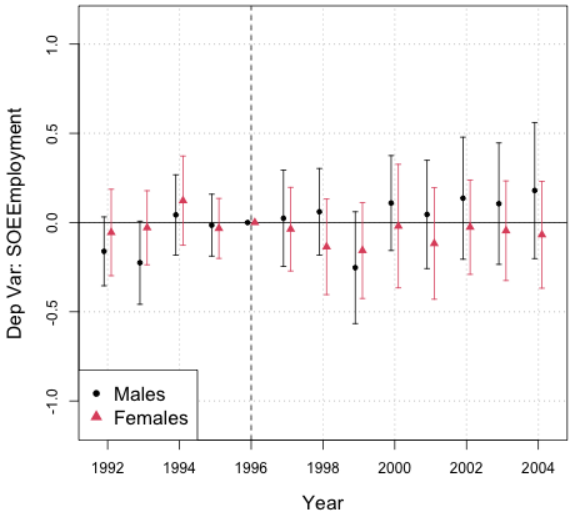
(c) Private Employment



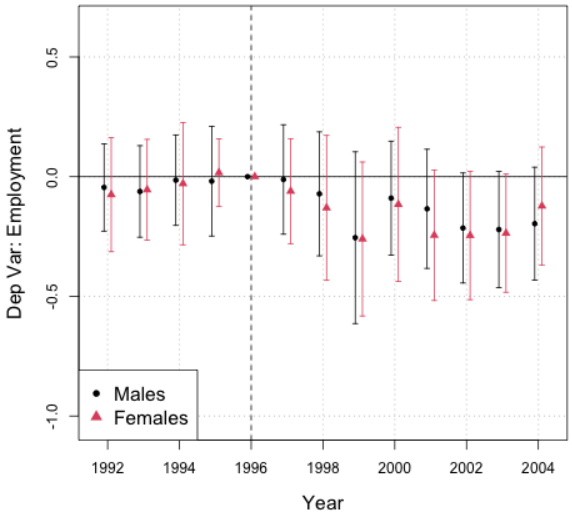
(d) Earnings (IHS)

Notes: We use the Event Study Approach to study the effect of SOE reform on employment and earnings by gender. We use the regional variation in the SOE employment share and UCE employment share in 1992 as our treatment. We include city and year fixed effect.

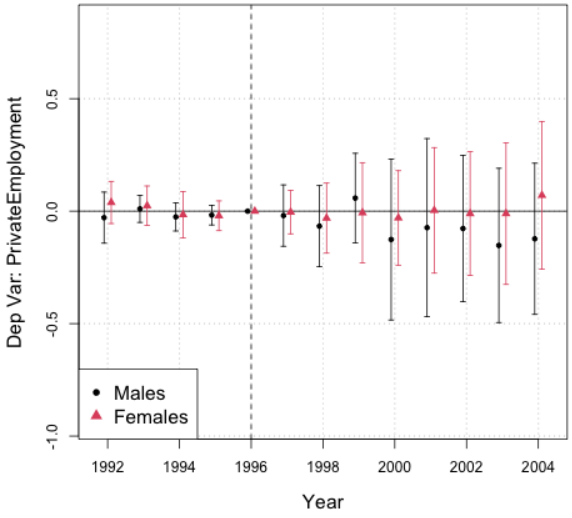
Figure A23: Event Study Results for Birth Cohort 1967-1982 (coefficients of Prereform SOE Emp Share)



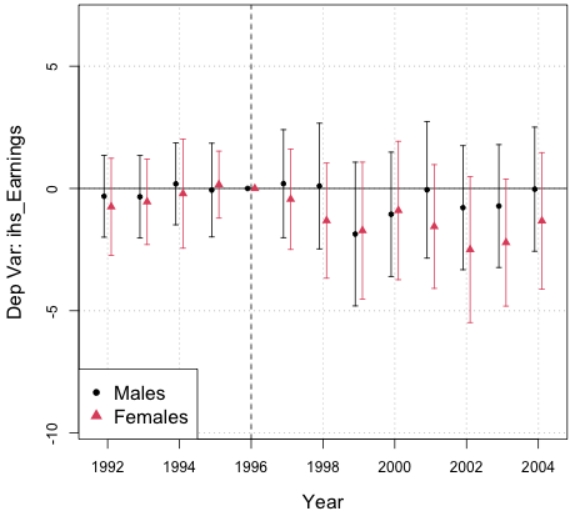
(a) SOE Employment



(b) Employment



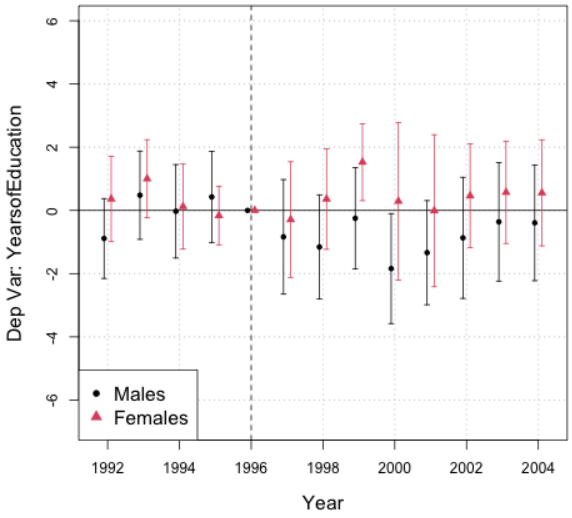
(c) Private Employment



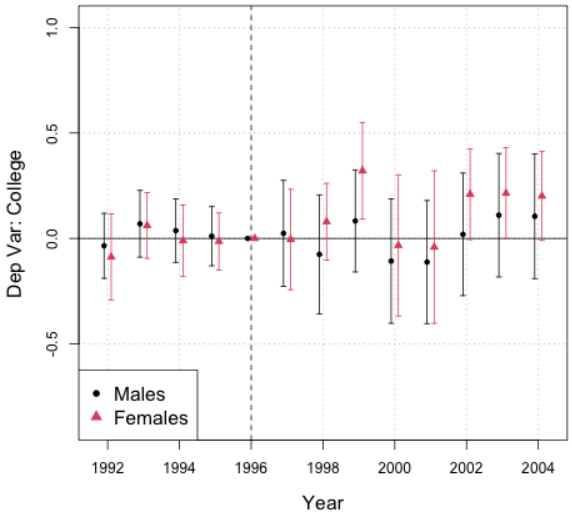
(d) ihs(Earnings)

Notes: We use the Event Study Approach to study the effect of SOE reform on employment and earnings by gender. We use the regional variation in the SOE employment share and UCE employment share in 1992 as our treatment. We include city and year fixed effect. We add the control for China's college expansion to address the confounding factors.

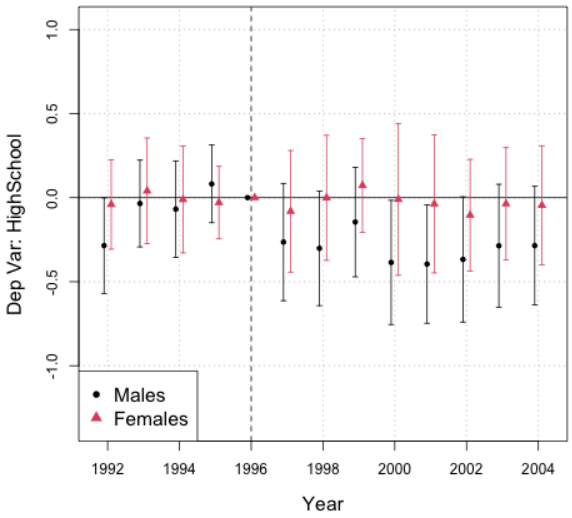
Figure A24: Event Study Results for Birth Cohort 1967-1982 (coefficients of Prereform SOE Emp Share)



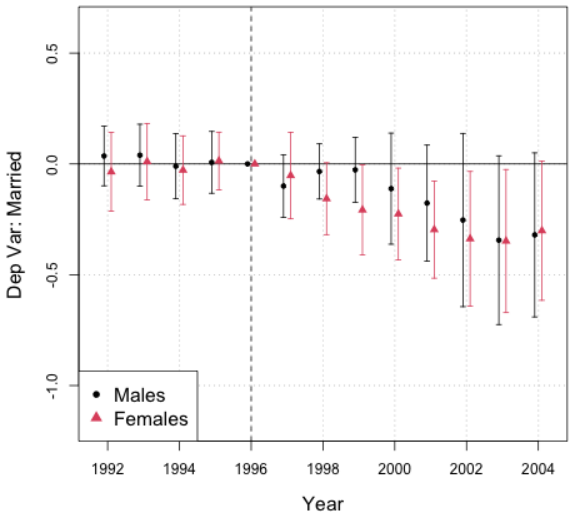
(a) Years of Education



(b) Some College Education



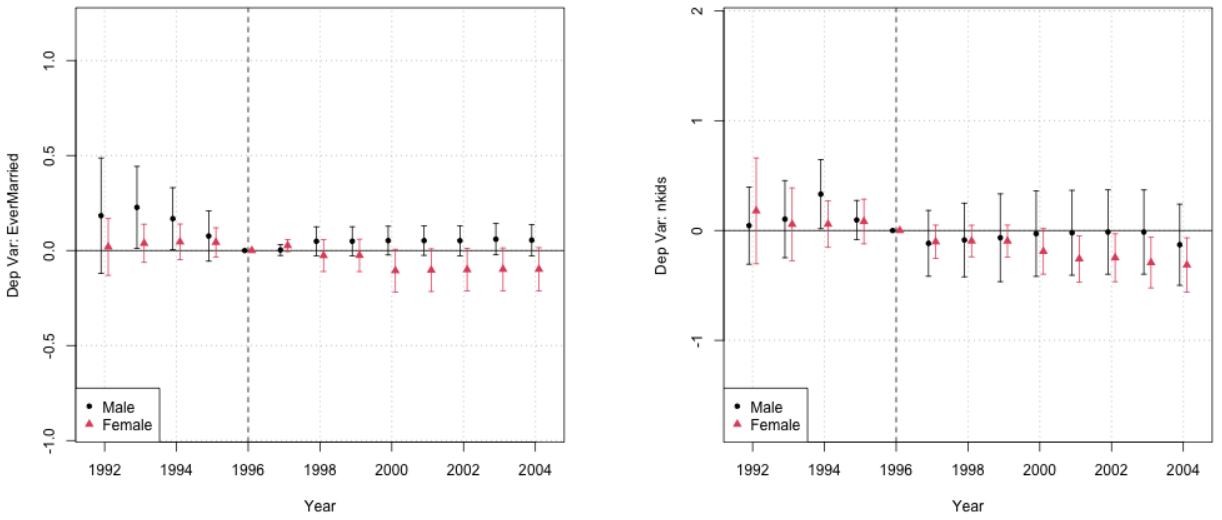
(c) High School



(d) Married

Notes: We use the Event Study Approach to study the effect of SOE reform on employment and earnings by gender. We use the regional variation in the SOE employment share and UCE employment share in 1992 as our treatment. We include city and year fixed effect. We add the control for China's college expansion to address the confounding factors.

Figure A25: Event Study Results for Birth Cohort 1952-1967 (coefficients of Prereform SOE Emp Share)

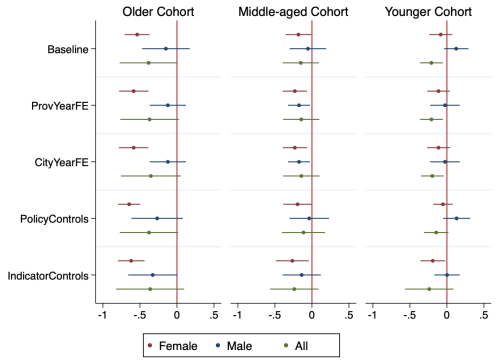


(a) Ever Married

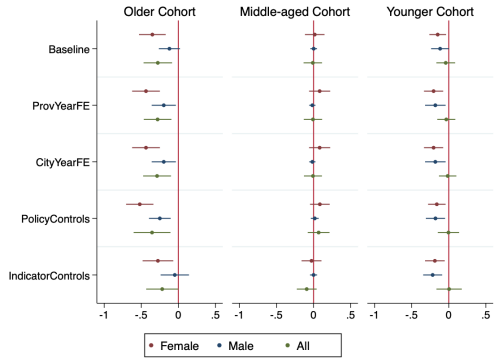
(b) Total Fertility

Notes: We create an individual panel of fertility and marriage using the retrospective survey from the CHARLS. We restrict the sample to cohorts born in 1952-1982 to study the middle-aged cohorts. Due to the design of the survey, the sample is lack of people born after 1970, so the youngest cohort is actually 1977. We control for individual and year FE.

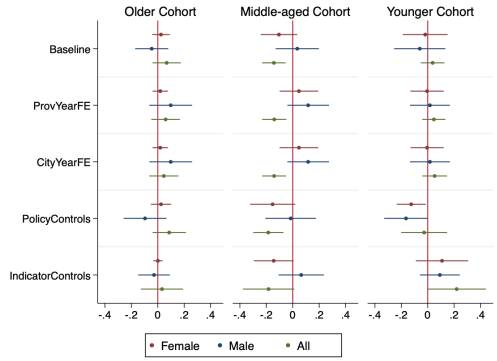
Figure A26: Robustness Results (coefficients of Prereform SOE Emp Share)



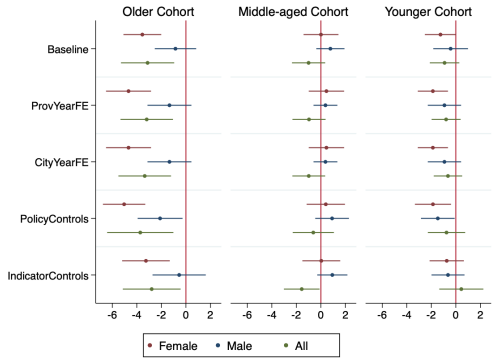
(a) SOE Employment



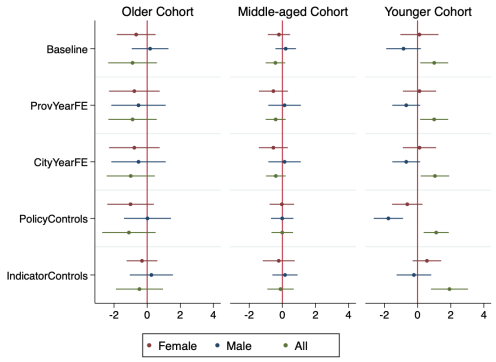
(b) Employment



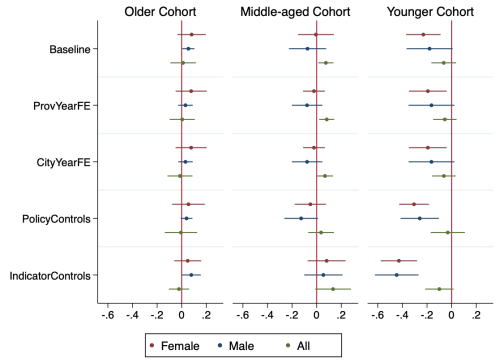
(c) Private Employment



(d) ihs(Earnings)



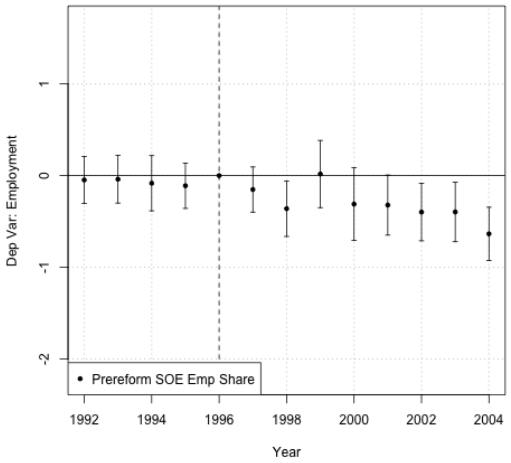
(e) Years of Education



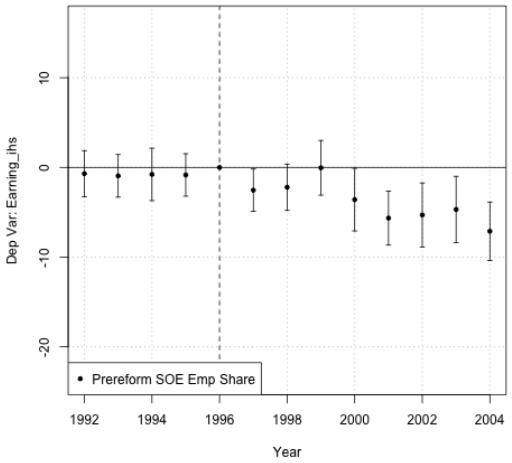
(f) Married

Notes: We present the coefficients of Prereform SOE Emp Share $\times$ post in the double-diff ("Female" and "Male") and coefficients of Prereform SOE Emp Share $\times$ post $\times$ female of the triple-diff ("All"). We add the controls as robustness checks. In the City Year FE version, we add prov-year FE in the double-diff and city-year FE in the triple-diff. Robust standard errors are clustered at the prefecture level, and confidence intervals are set at 90%.

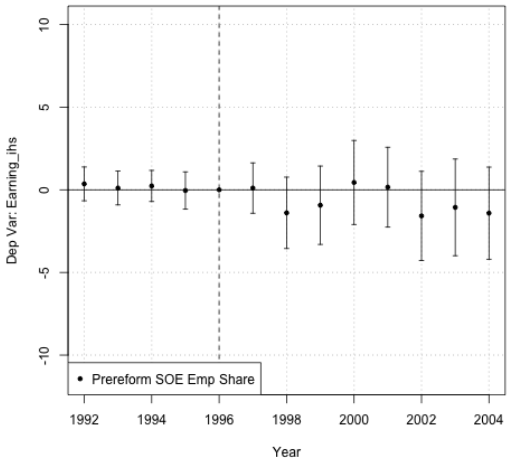
Figure A27: Robustness Check: Triple-Diff Event Study Results (coefficients of Prereform SOE Emp Share)



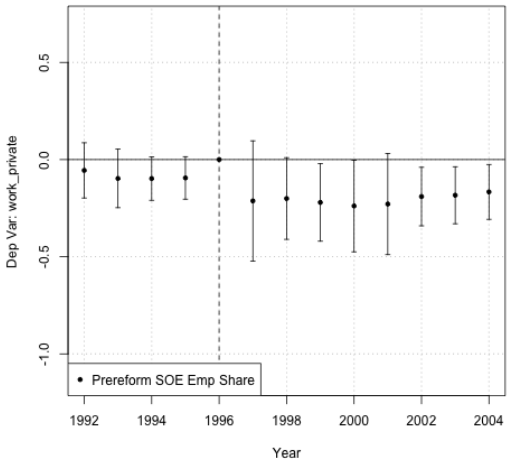
(a) Old Cohort: Employment



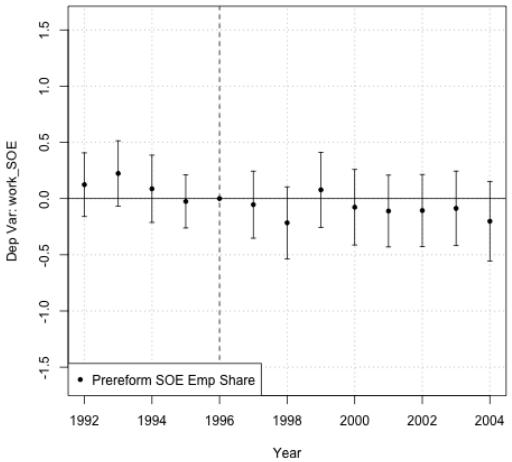
(b) Old Cohort: ihs(Earnings)



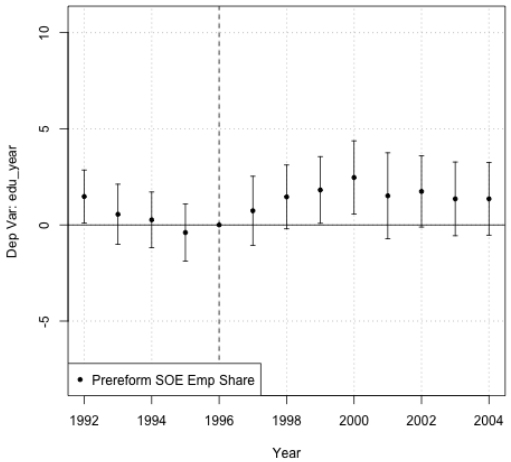
(c) Middle-aged Cohort: ihs(Earnings)



(d) Middle-aged Cohort: Private Employment



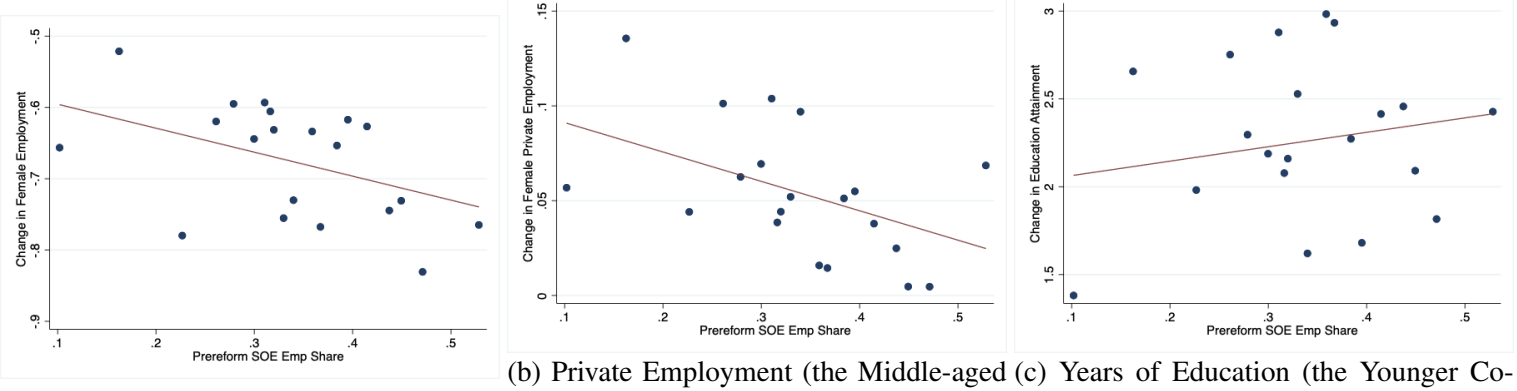
(e) Young Cohort: SOE Employment



(f) Young Cohort: Years of Education

Notes: We use the Triple-Diff Event Study Approach to study the effect of SOE reform by gender. Based on Equation 4, we add a prefecture-year fixed effect to absorb the effect of other policy shocks. We utilize the regional variation in the SOE employment share and UCE employment share in 1992 as the geographical treatment.

Figure A28: Test the Stronger Parallel Trend by Callaway et al. (2024)



(a) Female Employment (the Older Cohort)

(b) Private Employment (the Middle-aged Cohort)

(c) Years of Education (the Younger Cohort)

Notes: We aggregate the data at the prefecture-year level to test the stronger parallel trend assumption by Callaway et al. (2024). The y-axis is the change of variables from 1992 to 2004. The x-axis is the Prereform SOE Emp Share.

Table A2: Summary Statistics of Key Variables

	Male	Female	P-value
Panel A: 1992-1996			
Currently employed	0.80	0.72	
	(0.40)	(0.45)	0.00
Work in SOE	0.48	0.37	
	(0.50)	(0.48)	0.00
Work in private sector	0.02	0.01	
	(0.12)	(0.12)	0.00
Retirement	0.09	0.15	
	(0.29)	(0.36)	0.00
Unemployed	0.03	0.03	
	(0.16)	(0.17)	0.00
Monthly earnings (IHS)	7.38	6.46	
	(3.90)	(4.18)	0.00
Age	38.62	38.66	
	(13.75)	(13.20)	0.00
Married	0.72	0.73	
	(0.45)	(0.44)	0.00
Years of schooling	11.24	10.23	
	(2.58)	(2.80)	0.00
obs.	46,476	48, 006	
Panel B: 1997-2004			
Currently employed	0.71	0.59	
	(0.45)	(0.49)	0.00
Work in SOE	0.36	0.25	
	(0.48)	(0.43)	0.00
Work in private sector	0.06	0.05	
	(0.24)	(0.22)	0.00
Retirement	0.12	0.20	
	(0.32)	(0.40)	0.00
Unemployed	0.06	0.07	
	(0.23)	(0.26)	0.00
Monthly earnings (IHS)	6.50	5.21	
	(4.59)	(4.67)	0.00
Age	39.38	40.05	
	(13.77)	(13.34)	0.00
Married	0.69	0.72	
	(0.46)	(0.45)	0.00
Years of schooling	11.60	10.79	
	(2.52)	(2.69)	0.00
Obs.	133,930	139,287	

Note: Weighted means and standard deviations are presented. Standard deviations in parentheses. Data comes from UHS (1992-2004), age is restricted to between 16 and 64.

Table A3: SOE and UCE Employment Share in Each Industry

	SOE	UCE
Farming, forestry, animal husbandry and fishery	0.959	0.035
Mining	0.914	0.081
Manufacturing	0.608	0.254
Production and supply of electric power, gas and water	0.919	0.039
Construction	0.574	0.398
Geologic examination	0.983	0.016
Traffic, storage and mail business	0.824	0.162
Wholesale and retail trade	0.584	0.369
Finance	0.722	0.252
Real estate	0.771	0.089
Social welfare	0.717	0.187
Health, sports, social welfare	0.865	0.134
Education	0.983	0.016
Scientific research	0.939	0.042
Public administration and social organization	0.994	0.007
Other	0.723	0.263

Notes: Data source: China Labor Statistics Yearbook of 1992. This table shows the SOE and CE employment share in each industry. SOE stands for State-owned Enterprise and UCE stands for Urban Collective Enterprise.

Table A4: Summary Statistics of the Employment Shares

Variables	Mean	SD	Min	Max	N
Prereform SOE Emp Share	0.46	0.11	0.10	0.83	157
Prereform UCE Emp Share	0.17	0.06	0.04	0.33	163
Prereform SOE Emp Share after Adjustment	0.32	0.12	-0.05	0.69	157
Prereform UCE Emp Share after Adjustment	0.15	0.06	0.00	0.31	157
Reduction in Public Employment	0.20	0.09	0.00	0.51	163
Reduction in SOE Employment	0.13	0.07	-0.03	0.37	163
Reduction in UCE Employment	0.06	0.04	-0.06	0.20	163

Notes: Data come from China's Provincial and City Statistical Yearbook and 1990 Census. The denominator of the share is the 15-64 non-agriculture population sourced from 2000 Sensus. This sample includes the prefectures in Guangdong Province. We are not able to match every prefecture between the Census and the Statistical Yearbook, resulting in missing data for some prefectures. There exists negative value for the Prereform SOE Emp Share after Adjustment due to measurement error.

Table A5: More Education Results of SOE reform, birth cohort 1967-1982

	Women	Men	All	Women	Men	All
	Labor Force Participation			Unemployment		
Prereform SOE Emp Share × Post	0.008	0.013	0.017	0.157**	0.130	0.134
	(0.062)	(0.079)	(0.080)	(0.070)	(0.094)	(0.094)
Prereform SOE Emp Share × Post			-0.016			0.023
			(0.085)			(0.072)
	High school			College		
Prereform SOE Emp Share × Post	-0.122	-0.402***	-0.387***	0.036	-0.081	-0.096
	(0.098)	(0.108)	(0.109)	(0.085)	(0.100)	(0.104)
Female × Prereform SOE Emp Share × Post			0.264***			0.134
			(0.099)			(0.093)
N	42508	39181	81689	42508	39181	81689

Notes: The data source is the UHS 1992-2004. The full sample regressions also include Prereform UCE Emp Share × post, year-fixed effects and prefecture-gender fixed effects. The subsample regressions also include Prereform UCE Emp Share × post, year fixed-effects, and prefecture-fixed effects. All regressions include age dummies. Robust standard errors are clustered at the prefecture level. * significant at 10%, ** significant at 5%, *** significant at 1%.

Table A6: Effects on Gender Role Attitude

	(1) Men First under Job Risk	(2) Marriage Outdated	(3) Single Mother	(4) Children w/ Both Parents
Prereform SOE Emp Share ×Post × Female	2.392***	-0.956*	-0.221	-0.337
	(0.731)	(0.507)	(0.152)	(0.320)
Prereform SOE Emp Share ×Post	-2.519***	0.691	0.349	-0.0117
	(0.537)	(0.648)	(0.250)	(0.312)
Observations	1357	1320	1358	1376
Mean	0.410	0.173	0.0340	0.965

Notes: The data source is the World Value Survey in 1990 and 2001. The outcome variables are all binary and represent gender role attitude. Column (1)-(4) represent 'Men should come first under job loss risk", "Marriage is Outdated", "Woman as a single parent is acceptable", and "Children should be raised by both parents". Prereform SOE Emp Share is the provincial-level layoff rate provided by China Labor Statistical Yearbook. The definition is the same as the city level. $Post = 0$ if the survey is conducted before 1996 and $Post = 1$ if conducted after 1996. All regressions also include Female × Prereform UCE Emp Share × after, Prereform UCE Emp Share × after, age dummies, year fixed effects, and prefecture-gender fixed effects. We cluster the standard error at the provincial level. We weight the regression according to 1990 population in each province. * significant at 10%, ** significant at 5%, *** significant at 1%.

Table A7: Robustness Check: Sex Ratio

	Sex Ratio among Age 0-1		Sex Ratio among the Young Cohort	
	(1)	(2)	(3)	(4)
	1982 census	1990 census	1982 census	1990 census
Prereform SOE Emp Share	-0.0347	-0.0222	0.0294	0.0950
	(0.0292)	(0.0490)	(0.0488)	(0.0910)
Prereform UCE Emp Share	0.0816	0.0683	0.0733	-0.352*
	(0.0740)	(0.140)	(0.100)	(0.181)
Observations	134	156	134	156
Mean	1.021	1.058	1.075	1.130

The data source is the 1982 and 1990 census. We calculate the sex ratio among age 0-1 and the young cohort, using the two census. We cluster at the prefecture level. * significant at 10%, ** significant at 5%, *** significant at 1%.

Table A8: Effect of SOE reform on gender inequality, control for confounding policies, birth cohort 1967-1982

	Women	Men	All	Women	Men	All
Panel A	SOE Employment			Employment		
Prereform SOE Emp Share × Post	-0.053	0.131	0.095	-0.161**	-0.180**	-0.166**
	(0.079)	(0.111)	(0.116)	(0.071)	(0.078)	(0.076)
Female × Prereform SOE Emp Share × Post			-0.144			-0.004
			(0.100)			(0.087)
Panel B	Earnings (IHS)			Private Employment		
Prereform SOE Emp Share × Post	-1.865**	-1.469*	-1.171	-0.125*	-0.164	-0.102
	(0.890)	(0.831)	(0.898)	(0.066)	(0.100)	(0.133)
Female × Prereform SOE Emp Share × Post			-0.760			-0.027
			(0.921)			(0.105)
Panel C	Years of Education			Married		
Prereform SOE Emp Share × Post	-0.622	-1.763***	-1.728***	-0.306***	-0.259***	-0.282**
	(0.555)	(0.535)	(0.564)	(0.073)	(0.094)	(0.111)
Female × Prereform SOE Emp Share ×Post			1.123**			-0.031
			(0.459)			(0.084)
N	42506	39180	81686	42508	39181	81689

Notes: The data source is the UHS 1992-2004. The full sample regressions also include Prereform UCE Emp Share × post, gender-specific NTR gap, gender-specific number of college students, gender-specific OCP fine rates, year-fixed effects and prefecture-gender fixed effects. The subsample regressions also include Prereform UCE Emp Share × post, NTR gap, number of college students, OCP fine rates, year fixed-effects, and prefecture-fixed effects. All regressions include age dummies. All regressions include age dummies. Robust standard errors are clustered at the prefecture level. * significant at 10%, ** significant at 5%, *** significant at 1%.

Table A9: Effect of SOE reform on gender inequality, controlling for confounders in 1992, birth cohort 1942-1952

	Women	Men	All	Women	Men	All
Panel A	SOE Employment			Employment		
Prereform SOE Emp Share × Post	-0.618***	-0.327	-0.277	-0.275**	-0.048	-0.111
	(0.109)	(0.200)	(0.244)	(0.125)	(0.115)	(0.109)
Female × Prereform SOE Emp Share × Post			-0.362			-0.218*
			(0.277)			(0.130)
Panel B	Earnings (IHS)			Retirement		
Prereform SOE Emp Share × Post	-3.257***	-0.550	-0.992	0.321**	-0.002	0.091
	(1.173)	(1.309)	(1.276)	(0.146)	(0.150)	(0.147)
Female × Prereform SOE Emp Share × Post			-2.788*			0.281
			(1.422)			(0.193)
N	27680	28533	56213	27680	28533	56213

Notes: The data source is the UHS 1992-2004. The full sample regressions also include Prereform UCE Emp Share × after, year-fixed effects and prefecture-gender fixed effects. The subsample regressions also include Prereform UCE Emp Share × after, year fixed-effects, and prefecture-fixed effects. All regressions include age dummies. Robust standard errors are clustered at the prefecture level. We include three economics indicators in 1992, including *FDI/GDP*, *GDP per capita*, and *Electricity per capita*. We interact the measures with the post and female indicators and control in the triple-diff analysis. We interact the measures with the post indicator and control in the double-diff analysis. * significant at 10%, ** significant at 5%, *** significant at 1%.

Table A10: Effect of SOE reform on gender inequality, controlling for confounders in 1992, birth cohort 1952-1967

	Women	Men	All	Women	Men	All
Panel A	SOE Employment			Employment		
Prereform SOE Emp Share × Post	-0.265*	-0.138	-0.044	-0.028	0.000	0.046
	(0.134)	(0.156)	(0.173)	(0.081)	(0.029)	(0.033)
Female × Prereform SOE Emp Share × Post			-0.238			-0.092
			(0.197)			(0.081)
Panel B	Earnings (IHS)			Private Employment		
Prereform SOE Emp Share × Post	0.036	0.933	1.411*	-0.144	0.064	0.036
	(0.930)	(0.742)	(0.765)	(0.091)	(0.103)	(0.129)
Female × Prereform SOE Emp Share × Post			-1.561*			-0.183
			(0.877)			(0.117)
N	63423	59075	122498	63423	59075	122498

Notes: The data source is the UHS 1992-2004. The full sample regressions also include Prereform UCE Emp Share × Post, year-fixed effects and prefecture-gender fixed effects. The subsample regressions also include Prereform UCE Emp Share × Post, year fixed-effects, and prefecture-fixed effects. All regressions include age dummies. Robust standard errors are clustered at the prefecture level. We include three economics indicators in 1992, including *FDI/GDP*, *GDP per capita*, and *Electricity per capita*. We interact the measures with the post and female indicators and control in the triple-diff analysis. We interact the measures with the post indicator and control in the double-diff analysis. * significant at 10%, ** significant at 5%, *** significant at 1%.

Table A11: Effect of SOE reform on gender inequality, controlling for confounders in 1992, birth cohort 1967-1982

	Women	Men	All	Women	Men	All
Panel A	SOE Employment			Employment		
Prereform SOE Emp Share × Post	-0.191*	0.002	0.061	-0.188**	-0.217***	-0.207***
	(0.100)	(0.103)	(0.092)	(0.080)	(0.077)	(0.078)
Female × Prereform SOE Emp Share × Post			0.112			0.112
			(0.075)			(0.065)
Panel B	Earnings (IHS)			Private Employment		
Prereform SOE Emp Share × Post	-0.742	-0.638	-1.183	0.108	0.092	-0.045
	(0.843)	(0.813)	(0.837)	(0.120)	(0.091)	(0.120)
Female × Prereform SOE Emp Share × Post			0.839			0.033
			(0.806)			(0.058)
Panel C	Years of Education			Married		
Prereform SOE Emp Share × Post	0.435	-0.120	-1.133*	-0.429***	-0.447***	-0.403***
	(0.522)	(0.575)	(0.655)	(0.089)	(0.107)	(0.090)
Female × Prereform SOE Emp Share × Post			1.179***			-0.002
			(0.400)			(0.048)
N	38487	35914	74401	38489	35915	74404

Notes: The data source is the UHS 1992-2004. The full sample regressions also include Prereform UCE Emp Share × after, year-fixed effects and prefecture-gender fixed effects. The subsample regressions also include Prereform UCE Emp Share × after, year fixed-effects, and prefecture-fixed effects. All regressions include age dummies. We include three economics indicators in 1992, including *FDI/GDP*, *GDP per capita*, and *Electricity per capita*. We interact the measures with the post and female indicators and control in the triple-diff analysis. We interact the measures with the post indicator and control in the double-diff analysis. * significant at 10%, ** significant at 5%, *** significant at 1%.

Table A12: Poisson Regression Results of Earnings

	Dependent Variable: Earnings (Price in 2004)								
	Older Cohort			Middle-aged Cohort			Younger Cohort		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Women	Men	All	Women	Men	All	Women	Men	All
Prereform SOE Emp Share ×Post	-0.854***	-0.382	-0.290	0.00431	0.459	0.494*	0.0590	-0.521	-0.560
	(0.281)	(0.273)	(0.269)	(0.291)	(0.287)	(0.289)	(0.413)	(0.439)	(0.438)
Female ×Prereform SOE Emp Share × Post			-0.763*			-0.545***			0.632
			(0.390)			(0.206)			(0.668)
Observations	31762	32651	64413	74581	70026	144607	46429	42659	89088
Mean	3159.3	7958.3	5323.1	6519.2	9511.1	7901.2	4073.5	4645.8	4347.2

Notes: The data source is the UHS 1992-2004. The full sample regressions also include Prereform UCE Emp Share × Post, year-fixed effects and prefecture-gender fixed effects. The subsample regressions also include Prereform UCE Emp Share × Post, year fixed-effects, and prefecture-fixed effects. All regressions include age dummies. Robust standard errors are clustered at the prefecture level. * significant at 10%, ** significant at 5%, *** significant at 1%.

Table A13: Binary Treatment: Effect of SOE reform on gender inequality, birth cohort 1942-1952

	Women	Men	All	Women	Men	All
Panel A	SOE Employment			Employment		
Prereform SOE Emp Share × Post	-0.074***	-0.005	-0.006	-0.060**	-0.010	-0.009
	(0.023)	(0.037)	(0.038)	(0.028)	(0.015)	(0.015)
Female × Prereform SOE Emp Share × Post			-0.068*			-0.052*
			(0.040)			(0.027)
Mean	0.25	0.55	0.40	0.54	0.85	0.70
Panel B	Earnings (IHS)			Retirement		
Prereform SOE Emp Share × Post -0.621***	-0.023	-0.014	0.044*	-0.007	-0.008	
	(0.237)	(0.172)	(0.176)	(0.023)	(0.020)	(0.021)
Female × Prereform SOE Emp Share × Post			-0.628**			0.052
			(0.256)			(0.032)
Mean	4.81	8.12	6.49	0.44	0.17	0.30
N	31762	32651	64413	31762	32651	64413

Notes: The data source is the UHS 1992-2004. We replace the treatment variable to a binary version as a robustness check. Specifically, we define treat as 1 if the Prereform SOE Emp Share is above the mean (0.32), otherwise the treat is 0. The full sample regressions also include Prereform UCE Emp Share × post, year-fixed effects and prefecture-gender fixed effects. The subsample regressions also include Prereform UCE Emp Share × post, year fixed-effects, and prefecture-fixed effects. All regressions include age dummies. Robust standard errors are clustered at the prefecture level. * significant at 10%, ** significant at 5%, *** significant at 1%.

Table A14: Binary Treatment: Effect of SOE reform on gender inequality, birth cohort 1952-1967

	Women	Men	All	Women	Men	All
Panel A	SOE Employment			Employment		
Prereform SOE Emp Share × Post	-0.024	0.001	0.003	-0.001	0.002	0.003
	(0.020)	(0.024)	(0.024)	(0.014)	(0.005)	(0.005)
Female × Prereform SOE Emp Share × Post			-0.028			-0.004
			(0.025)			(0.015)
Mean	0.51	0.62	0.56	0.89	0.98	0.93
Panel B	Earnings (IHS)			Private Employment		
Prereform SOE Emp Share × Post	-0.008	0.188*	0.197*	-0.017	0.002	0.001
	(0.170)	(0.108)	(0.109)	(0.015)	(0.016)	(0.016)
Female × Prereform SOE Emp Share × Post			-0.210			-0.019*
			(0.167)			(0.010)
Mean	8.19	9.25	8.70	0.04	0.05	0.04
N	74581	70026	144607	74581	70026	144607

Notes: The data source is the UHS 1992-2004. We replace the treatment variable to a binary version as a robustness check. Specifically, we define treat as 1 if the Prereform SOE Emp Share is above the mean (0.32), otherwise the treat is 0. The full sample regressions also include Prereform UCE Emp Share × post, year-fixed effects and prefecture-gender fixed effects. The subsample regressions also include Prereform UCE Emp Share × post, year fixed-effects, and prefecture-fixed effects. All regressions include age dummies. Robust standard errors are clustered at the prefecture level. * significant at 10%, ** significant at 5%, *** significant at 1%.

Table A15: Effect of SOE Reform on Gender Inequality, Birth Cohort 1967-1982

	Women	Men	All	Women	Men	All
Panel A	SOE Employment			Employment		
Prereform SOE Emp Share × Post	0.013	0.017	0.018	-0.014	-0.025*	-0.023
	(0.018)	(0.016)	(0.017)	(0.014)	(0.014)	(0.014)
Female × Prereform SOE Emp Share × Post			-0.006			0.005
			(0.017)			(0.015)
Mean	0.39	0.40	0.40	0.69	0.69	0.69
Panel B	Earnings (IHS)			Private Employment		
Prereform SOE Emp Share × Post	-0.018	-0.095	-0.075	0.013	-0.006	-0.006
	(0.172)	(0.143)	(0.143)	(0.017)	(0.020)	(0.020)
Female × Prereform SOE Emp Share × Post			0.025			0.017
			(0.145)			(0.012)
Mean	6.24	6.30	6.27	0.06	0.06	0.06
Panel C	Years of Education			Married		
Prereform SOE Emp Share × Post	0.084	-0.168	-0.165	-0.041***	-0.023	-0.021
	(0.111)	(0.118)	(0.114)	(0.016)	(0.018)	(0.018)
Female × Prereform SOE Emp Share × Post			0.245***			-0.020*
			(0.085)			(0.010)
Mean	11.81	11.99	11.90	0.39	0.29	0.34
N	46427	42658	89085	46429	42659	89088

Notes: The data source is the UHS 1992-2004. We replace the treatment variable to a binary version as a robustness check. Specifically, we define treat as 1 if the Prereform SOE Emp Share is above the mean (0.32), otherwise the treat is 0. The full sample regressions also include Prereform UCE Emp Share × post, year-fixed effects and prefecture-gender fixed effects. The subsample regressions also include Prereform UCE Emp Share × post, year fixed-effects, and prefecture-fixed effects. All regressions include age dummies. Robust standard errors are clustered at the prefecture level. * significant at 10%, ** significant at 5%, *** significant at 1%.

Appendix E Author Contribution Statement

Yuli Xu and Sharon Xuejing Zuo contributed equally to the development of the research idea and the contextual understanding of relevant policy. Sharon Xuejing Zuo provided the data and secured funding for data collection. Yuli Xu conducted all data analyses and was primarily responsible for drafting the manuscript.