

Liberalization to Inequality: How China's State-Owned Enterprise Reform Restructures the Urban Labor Market

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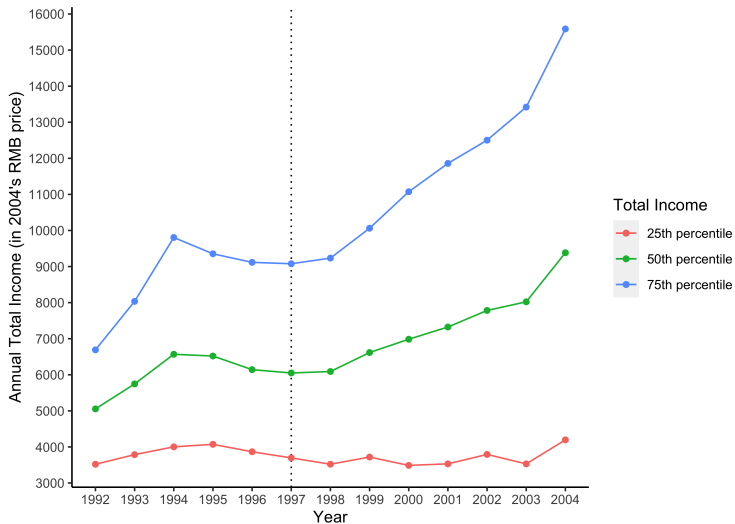
CESI, August 2023

Motivation

- Privatization doesn't benefit all parties in the economy equally.
 - ▶ Most studies focus on aggregate efficiency improvement of privatizing Stated-Owned Enterprises (SOEs)
(Anuatti-Neto et al., 2003; Song, 2011; Hsieh and Song,2015; Berkowitzetal.,2017).
 - ▶ Only few investigate the effect on workers (Olsson and Täg,2018; Arnold,2022).
- This paper focuses on workers' side.
 - ▶ State employment is an important policy tool (Subramanian and Megginson, 2018; Wen, 2020).
 - ▶ We argue that somebody could benefit less or even get hurt in the privatization, leading to inequality in the society.
 - ▶ Efficiency-equity tradeoff in privatization.
- We exploit China's SOE reform in the 1990s.

Why China?

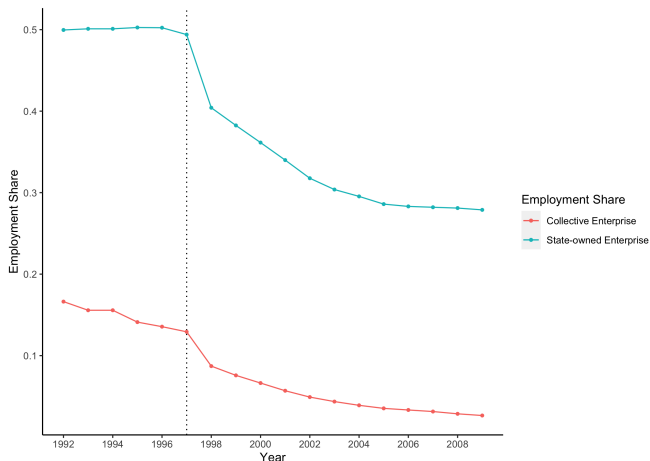
Reason 1: Increase in Income Inequality: 1992-2004



Source: Urban Household Survey.

Why China?

Reason 2: Large-scale Privatization: the State-Owned Enterprise (SOE) Reform - significantly liberalized the labor market.



Source: China Labour Statistical Yearbook.

Research Question

- 1 What is the effect of the SOE reform on individuals' labor market outcomes in urban China?
-Workers in prefectures with higher exposure to the reform experienced a more rapid decline in employment and a slower increase in income, compared to those in less exposed areas.
- 2 How much does the reform contribute to the increase in inequality in the late 1990s to early 2000s?
Across Prefecture: About 50% of the regional inequality.
Within Prefecture: More than 40% in terms of the gap in growth rates of income at the 25th and 75th percentiles.

Why Liberalization to Inequality?

- 1 Only the workers with high productivity survived the massive layoff.
⇒ An increase in SOE wage premium (Ge and Yang, 2014).
- 2 For people who got laidoff, reemployment was hard.
 - ▶ Difficult to shift mindset, attain much-needed skills, and adapt to the competitive job market.
 - ▶ Many chose to live at subsistence levels with severance payment.
 - ▶ Self-employment was always associated low income and low social status.

Contribution

● China's Inequality Literature

- ▶ Many papers have documented the rising inequality in China (Yang, 1999; Meng et al., 2013; Xie and Zhou, 2014; Ge and Yang, 2014; Piketty et al., 2019).
- ▶ To explain it, past literature mentions reasons like structural change, geographic location, wage structure, rural to urban migration, international trade, etc (Fleisher et al., 2010; Xie and Zhou, 2014; Alvaredo et al., 2017; Chen and Fleisher, 1996; Démurger, 2001; Xu, 2011; Appleton et al., 2014; Ge and Yang, 2014; Ravallion and Chen, 2007; Xie and Zhou, 2014; Sieg et al., 2023; Han et al., 2012).
- ▶ Other studies study the correlation between the SOE reform and earnings (Meng and Zhang, 2001; Ge and Yang, 2014; Tian, Gong, and Zhai, 2022).
- ▶ We use both DiD and event study approach to address the causality.

Contribution

- SOE Reform Literature

- ▶ Most papers on the SOE reform studies the efficiency improvement of firms (Song, 2011; Hsieh and Song,2015; Berkowitzetal.,2017).
- ▶ We study the “cost” in the labor market: efficiency-equity tradeoff.

- Very few studies distinguish SOEs and urban collective enterprises (UCEs)

(Jefferson et al.,1992;Bai etal.,2006; Huang et al.,2017).

- ▶ UCE workers are lower-educated and have lower social status.
- ▶ UCE workers receive lower severance payment after layoff.
- ▶ This leads to the differential effects in the labor market outcomes.

▶ Difference between SOEs and UCEs

Roadmap

- 1 Institutional Background
- 2 Data and Identification Strategy
- 3 Empirical Results
- 4 Conclusion

Labor Market Reform: from Centralization to Liberalization

1 Centralized Labor Assignment System before 1978

- ▶ Almost everyone works in the public sector (government, SOE, and UCE).
- ▶ Job-seekers would be assigned employment when they graduated: full and lifetime employment
- ▶ Firms not only provided employment, but also worked as “units”.

2 Transitional Period from 1978 to the 1990s

- ▶ SOEs gained more flexibility; the private sector emerged.
- ▶ Allowed for independent search for jobs; assignment still guaranteed for 2-year and 4-year college graduates.

3 Urban Labor Market after the 1990s SOE Reform

- ▶ In 1997, the government announced a policy to privatize and close most of medium and small size firms: *“Grasp the large, Let go of small”*.
- ▶ Between 1997 and 2000, over 35 million workers were laid-off.
- ▶ No job assignment anymore; labor market became competitive.

Data: Outcome Variables

- Urban Household Survey (1992-2004): 16 provinces covering 156 prefectures.
- Age 18-54

Table: Summary Statistics of Key Variables

	Before	After
<i>Panel A: selected labor market outcomes</i>		
Employment	0.87 (0.34)	0.76 (0.43)
Unemployment	0.03 (0.18)	0.08 (0.27)
Self-employment	0.02 (0.15)	0.12 (0.33)
Work in private sector	0.02 (0.13)	0.07 (0.25)
Monthly total income (in 2004 RMB)	530.86 (440.40)	683.86 (721.48)
<i>Panel B: individual characteristics</i>		
Age	36.47 (9.77)	38.17 (9.99)
Female	0.51 (0.50)	0.51 (0.50)
Years of schooling	11.11 (2.49)	11.66 (2.44)
Observations	77399	224605

Notes: Weighted means and standard deviations are presented. Standard deviations in parentheses. individuals between age 18 and 54. ▶

Data: Treatment Variables

$$\text{Pre-SOE Emp Share}_p = \frac{\text{SOE Employment}_{p,1992}}{\text{Working-age Population}_p}$$

$$\text{Pre-UCE Emp Share}_p = \frac{\text{UCE Employment}_{p,1992}}{\text{Working-age Population}_p}$$

▶ Details of the pre-shares

▶ Summary Stats the pre-shares

▶ Correlation between the pre-shares

Figure: Pre-SOE Emp Share

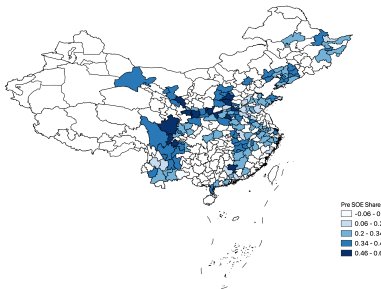
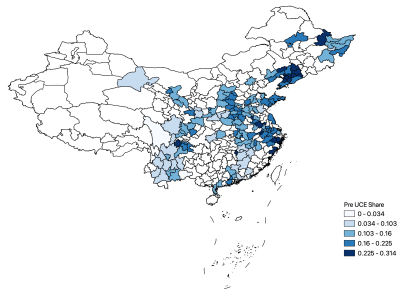


Figure: Pre-UCE Emp Share



Validating the Exposure Measures

1 How do the pre-shares proxy for the reform?

- ▶ We create the measurement *Reduction in the Public Sector Employment*.

$$\frac{\text{Public Employment}_{p,1996}}{\text{Working-age Population}} - \frac{\text{Public Employment}_{p,2000}}{\text{Working-age Population}}$$

- ▶ Both the pre-shares significantly predict the *Reduction in the Public Sector Employment*.

2 Do any other pre-reform employment shares predict *Reduction in the Public Sector Employment*?

- ▶ Employment by industry does not.
- ▶ Only Employment by ownership does.

▶ Validate the pre-shares

3 Does any pre-determined characteristics correlate with the pre-shares?

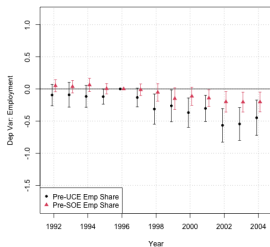
- ▶ We regress the pre-shares on a set of pre-determined local economic variables.
- ▶ The significance doesn't show up when we exclude Guangdong Province.

▶ Validate the pre-shares

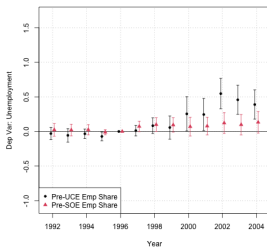
Results on Employment

$$Y_{ipt} = \alpha + \beta_1 \text{Post}_t \times \text{Pre-SOE Emp Share}_p + \beta_2 \text{Post}_t \times \text{Pre-UCE Emp Share}_p + \Phi X_{ipt} + \delta_p + \gamma_t + \epsilon_{ipt}$$

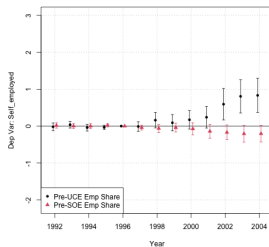
(a) Employment



(b) Unemployment



(c) Self-Employment



Compared to a prefecture without any SOE or UCE employment, a prefecture with average pre-SOE share (0.32) has **5.3 p.p. (6%)** more decline in employment; a prefecture with average pre-UCE share (0.15) has **4.9 p.p. (6%)** more decline in employment.

Results on Income

Figure: $ihs(\text{Earnings})$

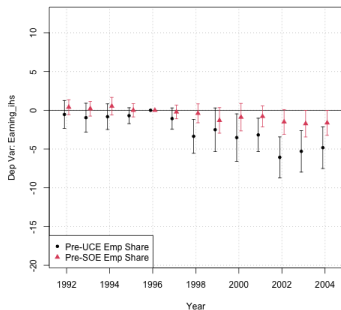
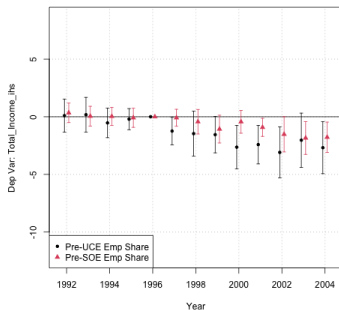
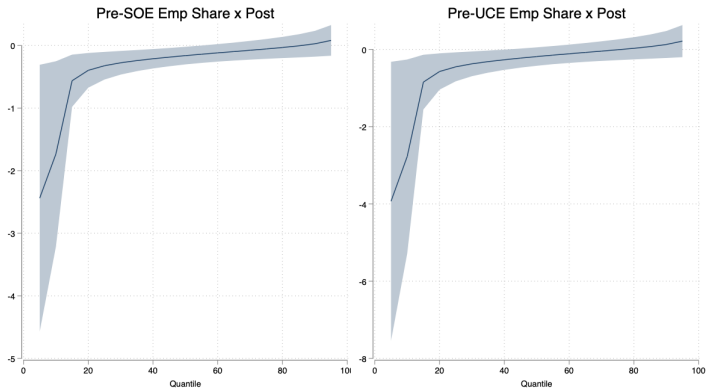


Figure: $ihs(\text{Total Income})$



Compared to a prefecture without any SOE or UCE employment, a prefecture with average pre-SOE share (0.32) has **37.2%** lower in income and a prefecture with average pre-UCE share (0.15) has **58.8%** lower in income.

Heterogenous Results: Income (Quantile regressions)



Heterogenous Results: Employment (by age and educational attainment)

	Below high school (1)	High school (2)	Above high school (3)
<i>Panel A: 18-25</i>			
Post × Pre-UCE Emp Share	-1.443*** (0.370)	-0.548 (0.342)	-0.223 (0.334)
Post × Pre-SOE Emp Share	-0.341* (0.203)	-0.028 (0.161)	-0.418** (0.170)
<i>N</i>	5465	13175	14207
<i>Panel B: 26-40</i>			
Post × Pre-UCE Emp Share	-0.181 (0.153)	0.019 (0.122)	-0.203** (0.100)
Post × Pre-SOE Emp Share	-0.114 (0.090)	-0.073 (0.060)	-0.034 (0.038)
<i>N</i>	22435	25825	34628
<i>Panel C: 41-54</i>			
Post × Pre-UCE Emp Share	-0.253 (0.211)	-0.555*** (0.196)	-0.207* (0.124)
Post × Pre-SOE Emp Share	-0.373*** (0.102)	-0.163 (0.124)	-0.020 (0.076)
<i>N</i>	40634	21299	27632

Notes: The mean of pre-UCE emp share and pre-SOE emp share is 0.15 and 0.32, respectively. Our sample includes 201 prefectures. * significant at 10%, ** significant at 5%, *** significant at 1%.

Prefecture Level Analysis: Results

$$Y_{pt} = \alpha + \beta_1 \text{Post}_t \times \text{Pre-SOE Emp Share}_p + \beta_2 \text{Post}_t \times \text{Pre-UCE Emp Share}_p + \delta_p + \gamma_t + \epsilon_{ipt}$$

	ihs(Real Earnings)			ihs(Real Total Income)		
	75th pct	50th pct	25th pct	75th pct	50th pct	25th pct
Pre-UCE Emp Share	-0.396 (0.247)	-1.079*** (0.377)	-4.404 (4.910)	-0.323 (0.233)	-0.826** (0.322)	-2.328** (1.021)
Pre-SOE Emp Share	-0.0421 (0.116)	-0.0774 (0.202)	-0.638 (2.327)	-0.0346 (0.121)	-0.0515 (0.159)	0.111 (0.618)
Observations	780	780	780	780	780	780

Notes: The mean of pre-UCE emp share and pre-SOE emp share is 0.15 and 0.32, respectively. Our sample includes 201 prefectures. * significant at 10%, ** significant at 5%, *** significant at 1%.

A Back-of-the-Envelope Analysis

- 1 **Across percentiles of the income:** Our results predict a 29.92 p.p. gap in growth rate between the 25th and 75th percentiles. It accounts for about 40% of the total gap.
- 2 **Across prefectures:** Our results predict a 23.3 p.p. difference between prefectures. It accounts for about 50% of the regional income inequality.
- 3 **Across educational attainment:** Our results indicate a 14.2 p.p. income difference between high and low educated groups. It accounts for 15.8% of the total inequality increase between these two groups.

Conclusion

- 1 This paper investigates how China's large-scale reform of SOEs in the late 1990s restructures the urban labor market and contributes to overall income inequality.
- 2 Overall, we find the prefectures more exposed to the SOE reform lagged those that were less exposed.
- 3 The findings can also be applied to other contexts to understand the evolution of income inequality associated with the change of labor market policies.

Appendix

SOE and UCE

While SOE and UCE are all within the public sector of China, they are different in some ways:

- Job security is higher in SOE. (Parker, 1994)
- Employees have more years of education in SOE.
- The ownership of UCE is more obscure. It has some autonomy (compared to the central-planning scheme in SOE).
- SOE is more capital-intensive while UCE is labor-intensive. (Jefferson, 1989, 1992)
- SOE bears more responsibility on social stability. (Bai, 2006)
- The re-employment engineering program mostly targets on SOE laid-off workers. (Lee, 2000)

▶ go back

Construct the Pre-shares

To construct the pre-reform SOE and UCE employment shares :

- 1 Original Data from the Statistical Yearbook of each prefectures.
- 2 Exclude some industries' employment from 1990 Census that are not affected by the layoff. (agriculture, finance, real estate, health, and education).

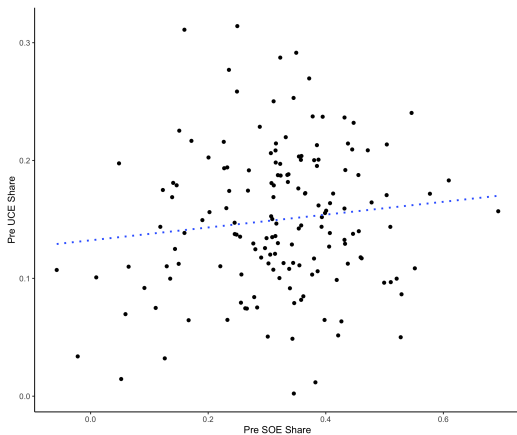
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Summary Statistics

Variables	Mean	SD	Min	Max	N
Pre-SOE Emp Share	0.46	0.11	0.10	0.83	157
Pre-UCE Emp Share	0.17	0.06	0.04	0.33	163
Pre-SOE Emp Share after Adjustment	0.32	0.12	-0.05	0.69	157
Pre-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

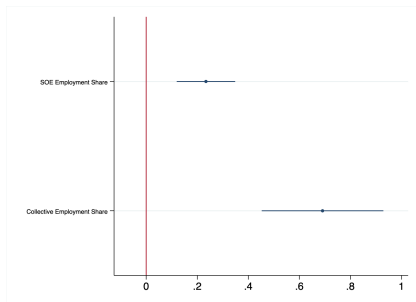
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Correlation between Pre-SOE share and Pre-UCF share

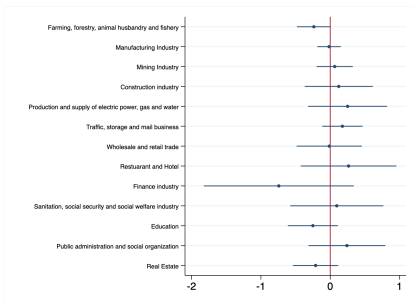


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Validity of the Exposure Measurements



(a) By Ownership



(b) By Industry

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Do Pre-Determined Characteristics Correlate with the Pre-reform SOE and UCE Employment Shares?

	All Cities		Cities w/o Guangdong	
	pre-SOE Share	pre-UCE Share	pre-SOE Share	pre-UCE Share
FDI per GDP	-4.480** (2.001)	-0.415 (0.887)	1.704 (3.043)	1.526 (1.281)
GDP per capita	-0.003*** (0.0009)	-0.001*** (0.0003)	-0.004** (0.0002)	-0.001 (0.0007)
FinanceIncome per GDP	0.339 (0.595)	0.0012 (0.384)	-0.042 (0.671)	-0.198 (0.453)
FinanceExpense per GDP	0.813 (0.551)	-0.109 (0.354)	0.940 (0.583)	0.148 (0.380)
Tertiary GDP Share	0.0254 (0.163)	-0.0174 (0.0631)	-0.0243 (0.167)	-0.0691 (0.0660)
Secondary GDP Share	0.318** (0.136)	0.143** (0.0639)	0.352** (0.154)	0.121* (0.0723)
Observations	134	134	121	121

Standard errors in parentheses

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

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The Survey Sampling Issue and Reweighting

- 1 UHS data are known to overrepresent workers from state and collective enterprises compared to others. (Ge and Yang, 2014)

$$Weight_emp_{ict} = \begin{cases} \frac{SOEShare_{admin}}{SOEShare_{UHS}} & \text{For Gov \& SOE workers } i \\ \frac{CollectiveShare_{admin}}{CollectiveShare_{UHS}} & \text{For Collective workers } i \\ \frac{1 - PublicShare_{admin}}{1 - PublicShare_{UHS}} & \text{For non-public workers } i \end{cases}$$

- 2 UHS Reform in 2002 - Expand the survey subjects triply.

$$Weight_year_{ict} = \begin{cases} 1 & t < 2002 \\ \frac{AverageSampleSizeBefore2002_{ict}}{AverageSampleSizeAfter2002_{ict}} & t \geq 2002 \end{cases}$$

- 3 Calculate the total weight.

$$Weight_ict = Weight_emp_{ict} \times Weight_year_{ict}$$

Validity of the Layoff Intensity Measurement

$$Work_public_{ict} = \beta_0 + \sum_{e=1992}^{2004} \beta_e \Delta Public_share_c \times year_t + \mu_c + \sigma_t + \epsilon_{ict}$$

Figure: Without weighting

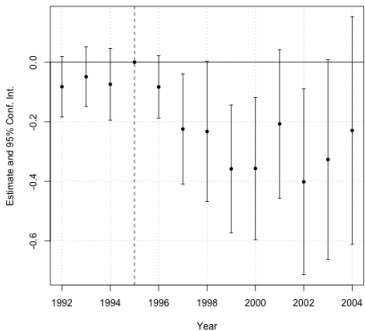
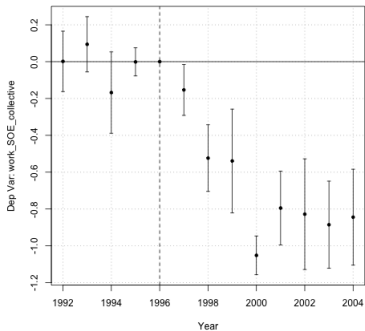
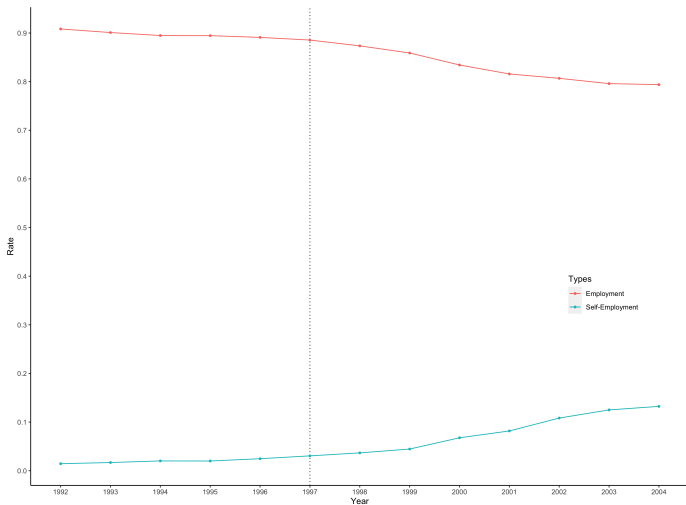


Figure: With weighting



National Change in Employment



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