Economic Restructuring and Children's Educational Attainment: Lessons from China's State-owned Enterprises Reform

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June 2016

Motivation

- Aggregate economic shocks can have adverse impacts on children in developing countries
  - Frankenberg et al., 1999; Thomas et al., 2004; Paxson and Schady, 2005; Cameron, 2009
- This paper studies the impact of a special form of aggregate economic shock, i.e., economic restructuring on one or several specific sectors or industries
- Economic restructuring can be brought about by
  - general development trends, such as globalization and technological progress
  - or government-initiated reforms and updates of certain industrial policies

Literature

- Existing studies on economic restructuring mainly focus on its immediate impacts
  - reallocative costs of job turnover (Walker, 2014; Autor, 2015)
  - increased income inequality (Autor et al,1998; Acemoglu,2002; Keane and Prasad, 2002)

- This paper explores the intergenerational cost of economic restructuring on children's educational attainment

Overview

- **Research goal:** Investigating the impact of economic restructuring on children's educational attainment using China's SOE reform (1995-2001) as a quasi-natural experiment
  - SOE workers were subject to layoffs, reduced cumulative earnings and diminishing welfare
  - Non-SOE organizations in the public sector were less affected
    - Government agencies (GOV) & public institutions(PUB)
- **Strategy**: comparing education levels of SOE children with non-SOE children over cohorts

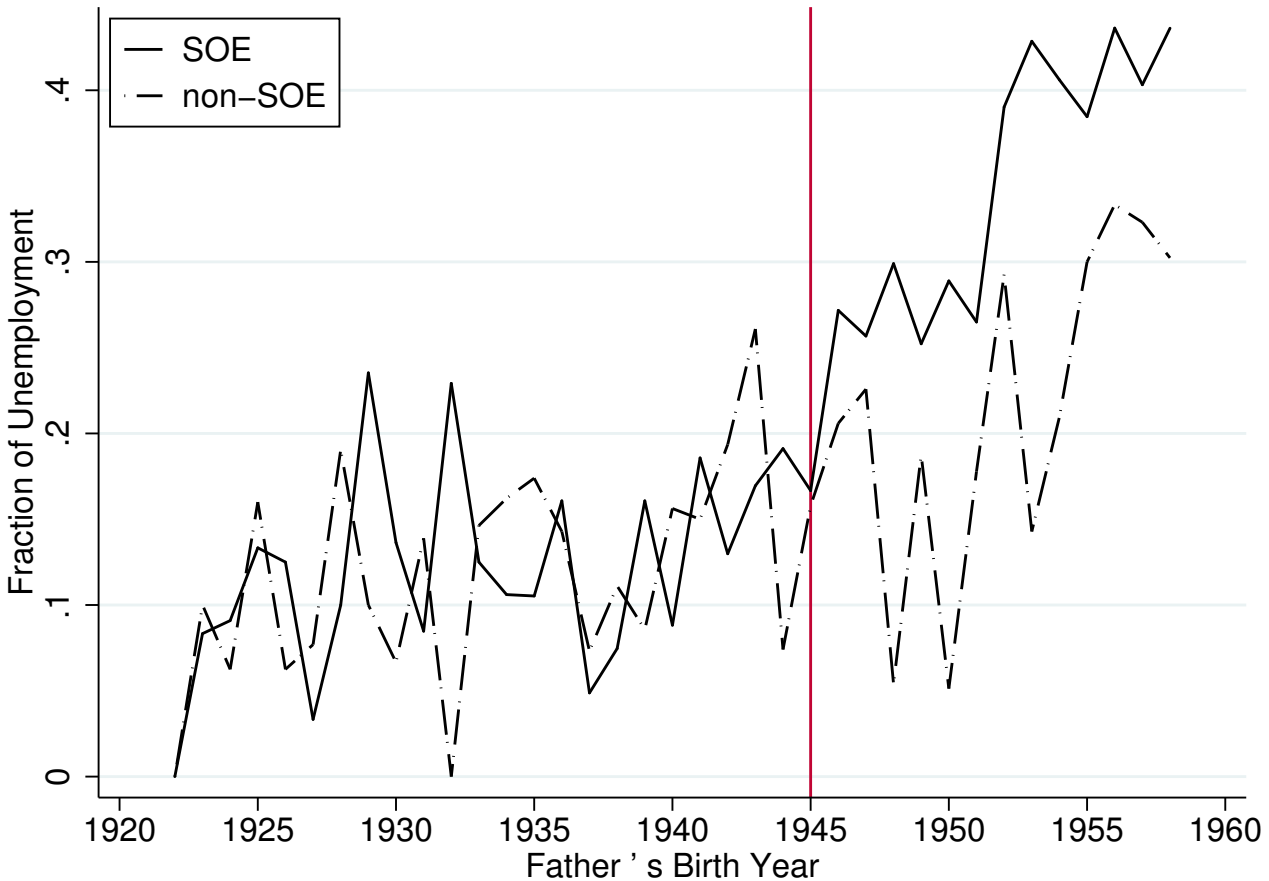
Background of the SOE reform

- The profit of SOEs as a share of GDP has been decreasing since China's Opening-up policy in 1978
  - Internal: Inefficiency, overstaffing, lack of incentives, etc.
  - External: competition from private sectors in rural areas
    - e..g. the rise of TVEs (Township and village enterprises)
- However, SOEs were strongly supported by the government before 1995

"Grasp the big, let go of the small"

- The policy to reform SOEs was officially implemented starting from 1995
- Retained responsibility for around 500 big SOEs, but for those small and loss-making SOEs
  - Reduced state subsidies
  - Corporized or shut down
- Between 1996 and 2001, close to 50,000 of the smaller and medium-size SOEs had been restructured(Yusuf, Nabeshima, and Perkins, 2006).

Differential impacts: Unemployment risk by sectors



Source: CULS2001. This figure shows the differential impacts of SOE reform across sectors. Unemployment is a dummy taking value of 1 if this person has ever been unemployed before, and include those who ever been laid off, involuntary retirees, registered as unemployment, or without work and actively searching for work.

Data

- China Urban Labor Survey 2001
  - Designed to study the impact of SOE reform on the labor market
  - 5 cities with large regional diversity
  - Detailed employment history
  - Family ties, social connections

The Impacts on children

Regression with standard specification (DID)

$$E_{ias} = \alpha_0 + \alpha_1 SOE_{is} \times Postshock_{ia} + \theta^J X_{ias} + \rho_a + \eta_s + \varepsilon_{ias}$$

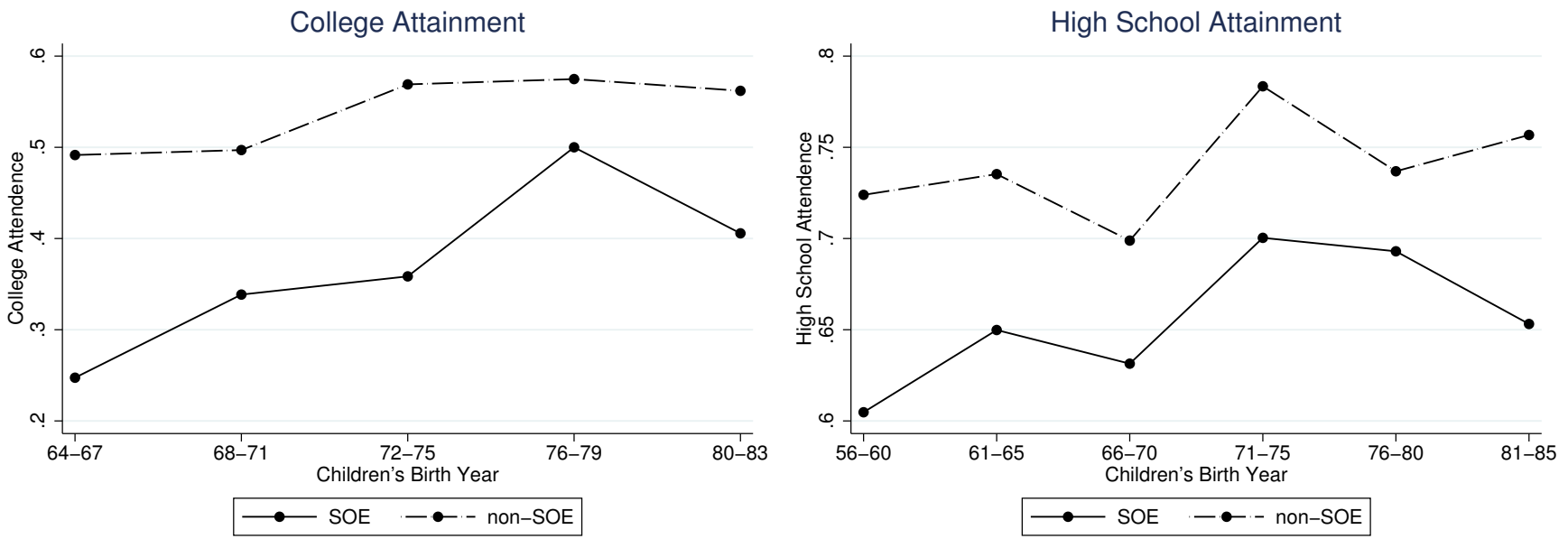
- E_{ias} is the educational attainment of children i, in age group a, with father employed in sector s
- SOE_{is}=1 if children i's father's initial job is in SOE.
  - Treatment group: children whose fathers worked in SOEs before SOE reform (SOE children)
  - Control group: children with fathers from non-SOEs before SOE reform (non-SOE children)
- ρ_a is age fixed effect and η_s is sector fixed effect.

Table: Impacts on children's educational attainment: difference-in-difference results

DEP VARIABLES	(1) College	(2) College	(3) High School	(4) High School
Post-shock Cohort × Father in SOE	-0.0564*	-0.111***	-0.0803***	-0.0784**
	(0.0318)	(0.0391)	(0.0180)	(0.0378)
Mean of Outcome Variable	0.4345	0.4345	0.6871	0.6871
Observations	1,855	1,855	2,822	2,822
Children and Parent Controls	Yes	Yes	Yes	Yes
Children's Cohort × Parental Job FE	No	Yes	No	Yes

Robust standard errors are clustered at community level (70 clusters). Cohort fixed effect and job sector fixed effect are included in all sepecifications. Parental controls include the parent's education, party membership, height, occupation dummies, industry dummies, early life experience, school ranking, school quality, etc. Children contorls include the number of children's siblings, sisters, and brothers. *** p<0.01, ** p<0.05, * p<0.1.

Time Trend (unweighted)



Sources: CULS2001. Children born between 1981-1985 are the post-shock group, whose education were affected by the shock. The rest cohorts constitute the pre-shock group, whose education were not affected by the shock.

Confounders: divergence in return to education

- Father's income might have changed due to the divergence in returns to education
  - non-SOE employees were in general more educated than SOE workers
  - the return to college-and-above education rose from 16% to 50% in the 1990s
  - junior high school remained below 20%
- Add father's educational attainment and school performance interacted with children's cohorts as controls

Robustness check: Divergence in return to education

DEP VARIABLES	(1) College	(2) College	(3) College	(4) High School	(5) High School	(6) High School
Post-shock Cohort × Father in SOE	-0.100**	-0.0886**	-0.0879**	-0.0743**	-0.0649*	-0.0729**
	(0.0405)	(0.0387)	(0.0387)	(0.0348)	(0.0352)	(0.0353)
Post-shock Cohort × Father's Education	0.0109	0.00599	0.00419	0.000996	0.00194	0.00137
	(0.00749)	(0.00729)	(0.00741)	(0.00645)	(0.00804)	(0.00582)
Post-shock Cohort × Father's Pschool Quality		0.160***	0.150**		0.108*	0.0941
		(0.0593)	(0.0735)		(0.0623)	(0.0681)
Post-shock Cohort × Father's Mschool Quality		0.226*	0.209*		0.0977	0.124**
		(0.127)	(0.125)		(0.0720)	(0.0593)
Post-shock Cohort × Father's Hschool Quality		-0.0211	-0.0376		0.0325	0.0312
		(0.0739)	(0.0722)		(0.0922)	(0.0951)
Post-shock Cohort × Father's Pschool Ranking			-0.147**			0.0176
			(0.0627)			(0.122)
Post-shock Cohort × Father's Mschool Ranking			0.0817			0.0704
			(0.186)			(0.177)
Post-shock Cohort × Father's Hschool Ranking			0.0899			-0.192
			(0.0857)			(0.132)
Mean of Outcome Variable	0.4345	0.4345	0.4345	0.6871	0.6871	0.6871
Observations	1,855	1,855	1,855	2,821	2,822	2,821

Additional robustness checks

- Other reforms
  - Housing Reform in 1994, Wage Reform in 1993, College expansion and tuition change in 1999
- Other cohort-varying observables
  - Add more father's demographic interactions
- Other cohort-varying unobservables
  - Falsification exercises using placebo post-shock cohort
- Special economic zones (Wang, 2013)
  - Drop Shanghai
- Include the prviate sector into the control group
- Mortality attrition: use younger cohorts

Geographical Externality

- Geographical externality: larger impacts in cities with larger pre-reform SOE share or post-reform layoff share
- Workers in cities with more laid-offs facing higher competition in seeking new jobs
  - $=>$ Longer unemployment spells
  - $=>$ Lower equilibrium wage

Geographical Externality

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- Workers in cities with more laid-offs facing higher competition in seeking new jobs
  - $=>$ Longer unemployment spells
  - $=>$ Lower equilibrium wage
- Tripple difference strategy across cities, children's cohorts, and organizations where fathers worked
- This method also allows differencing out the cohort-varying unobservables

Triple Difference

A triple-difference model (DDD):

$$E_{iasc} = \alpha_0 + \alpha_1 SOE_s \times Postshock_a \times Intensity_c + \tau_{cs} + \lambda_{as} + \mu_{ac} + \theta^J X_i + \varepsilon_{iasc}$$

- c denotes city, s sector, and a age group.
- $Intensity_c$, measured in 3 ways, is the shock intensity in city c.
- The specification includes a full set of double interactions, namely, city-sector(τ_{cs}), age-sector(λ_{as}), and age-city(μ_{ac}).

Shock Intensity is Measured in 3 Ways

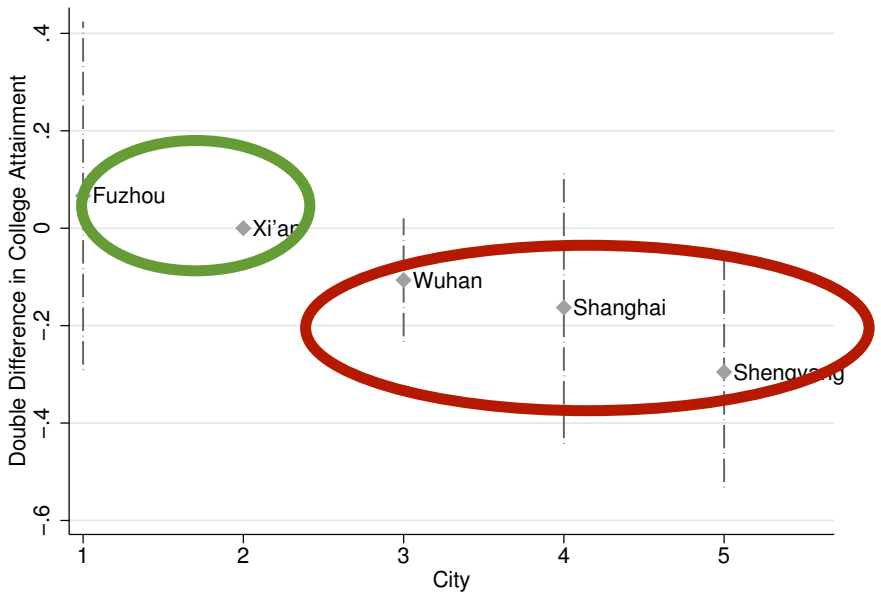
1. Pre-reform SOE share = Pre-reform SOE workers/ Pre-reform total labor force
   - Data from local statistical yearbooks
2. Post-reform layoff share = Laid-off workers(between 1995-2001) / City population
   - Caculated based on the sample
3. City Dummy: equas 1 if the city is either Shanghai, Wuhan, or Shenyang
   - Three cities with significantly larger SOE share and layoff share

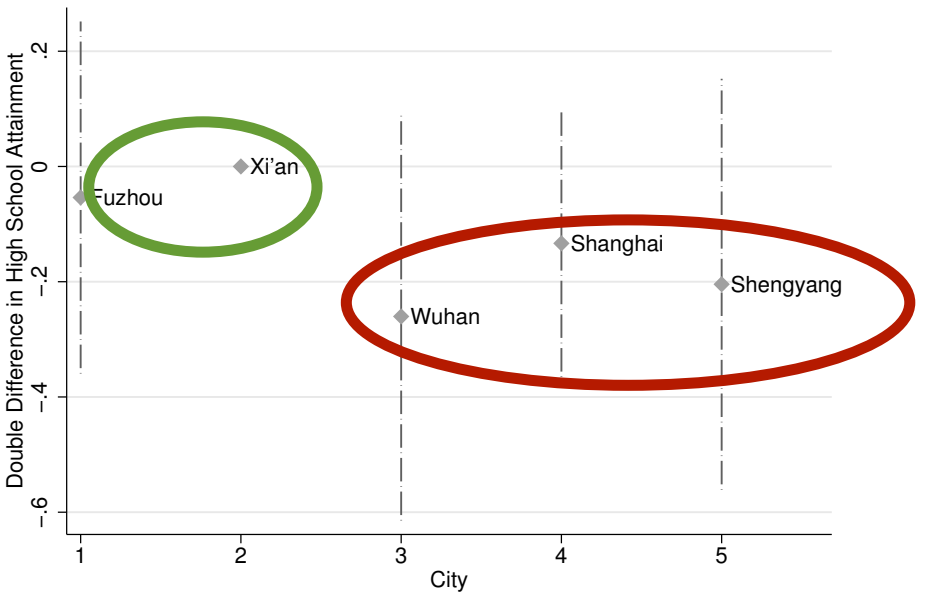
Triple difference (DDD)

	College			High School		
	(1)	(2)	(3)	(4)	(5)	(6)
INTENSITY MEASURE	SOE Share	Layoff Share	City Dummy	SOE Share	Layoff Share	City Dummy
Post-shock Cohort × Father in SOE	-0.737**	-0.409*	-0.208**	-0.774	-0.290*	-0.181*
× Intensity	(0.314)	(0.228)	(0.103)	(0.528)	(0.163)	(0.106)
Post-shock Cohort × Father's Job FE	Yes	Yes	Yes	Yes	Yes	Yes
City Dummy × Father's Job FE	Yes	Yes	Yes	Yes	Yes	Yes
City Dummy × Post-shock Cohort	Yes	Yes	Yes	Yes	Yes	Yes
Mean Outcome of Variable	0.4345	0.4345	0.4345	0.6871	0.6871	0.6871
Observations	1,498	1,855	1,855	2,272	2,822	2,822

Robust standard errors are clustered at community level (70 clusters). Layoff Share is the percentage of workers who report ever being laid off during the reform. SWS=Shenyang, Wuhan, or Shanghai, where the layoff share are significantly larger than others. SOE Share is the city-wide employment share of SOE workers before the shock. This information is available in city-level statistical yearbooks except Shanghai. Father and children controls are included in all specifications. *** p<0.01, ** p<0.05, * p<0.1.

Triple difference coefficients, by city





Sources: CULS2001.

Are there any heterogeneous effects?

- The impact of the economic shock may differ across children's gender
  - Girls are more vulnerable to income shock than boys in developing countries (Ferreira & Schady, 2009; Bhalotra, 2010; Baird et al., 2010)
  - Not supported by evidence
- Siblings may provide informal support
  - Informal insurance within extended family members (Fafchamps and Lund, 2003; Fafchamps, 2011)
  - Siblings can provide job information and referrals
  - Supported by evidence

Gender Effect

	College	High School
	(1)	(2)
Post-shock Cohort × Father in SOE	-0.0741	-0.0748*
	(0.0489)	(0.0417)
Post-shock Cohort × Father in SOE × Boy	-0.0724	-0.00680
	(0.0844)	(0.0700)
Gender FE	Yes	Yes
Mean Outcome of Variable	0.4345	0.6871
Observations	1,855	2,822

Sibling effect

	College		High School	
	(1)	(2)	(3)	(4)
SIBLING MEASURE	Siblings	Brothers	Siblings	Brothers
Post-shock Cohort × Father in SOE × Parental Siblings	0.0165**	0.0394***	0.0189**	0.0207***
	(0.00721)	(0.0100)	(0.00734)	(0.00661)
Post-shock Cohort × Father in SOE	-0.142***	-0.164***	-0.179***	-0.137***
	(0.0504)	(0.0297)	(0.0365)	(0.0257)
Sibling FE	Yes	Yes	Yes	Yes
Brother FE	No	Yes	No	Yes
Mean Outcome of Variable	0.4345	0.4345	0.6871	0.6871
Observations	1,855	1,855	2,822	2,822

Conclusion

- This paper shows the adverse impact of economic restructuring on children's education in a developing country
  - Shocks are partially alleviated through informal social networks, but the scale of the overall impact is still large
  - The existence of georgraphical externality can aggravate the adverse impact of economic restructuring
- Policy Implications:
  1. Intergenerational cost of economic restructuring should be taken into consideration in designing and evaluating relevant policies
  2. Information for policy makers with regards to more targeted social aid programs