Biting the Hand That Teaches: Unraveling the Economic Impact of Banning Private Tutoring in China

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Overview

Introduction

- Industrial policy is an important and controversial topic in economics
- It helps infant industries to grow? Or leads to market distortion?
- But everyone is discussing "beneficial" industrial policy
- What about "destructive" industrial policy?

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- But sometimes untargeted agents can also be affected
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  How can a destructive industrial policy affect the the targeted and the untargeted firms and how do they respond?
- We investigate the Double Reduction Policy in China to answer this question
- Two datasets: Online job postings + Firm registration

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- Shadow education after regular schools
- Government decides to ban for-profit academic tutoring
- The Double Reduction (DR) Policy in July 2021

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  - Rich people can afford private tutoring $\Rightarrow$ Education inequality
  - Overcompetition and involution $\Rightarrow$ physical and mental health issue
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Introduction: Preview of the Results

- For academic private tutoring firms
  - Can DR Policy encourage the growth of extracurricular tutoring firms? **NO!**
  - Untargeted firms were also severely hurt. Cities with 10,000 more children $\Rightarrow$ Monthly job postings
  - 40% of former investors stay in education sector when they open new businesses However, they avoid academic tutoring services

Introduction: Preview of the Results

- For academic private tutoring firms
  - 2021.7-2021.11, job postings $\downarrow$ 89%, firm entries $\downarrow$ 50%, firm exits $\uparrow$ 300%
  - Cities with 10,000 more children (2 percent) $\Rightarrow$ Monthly job postings $\downarrow$ 20 (3.2%), firm entries $\downarrow$ 0.3 (6.7%), firm exits $\uparrow$ 0.1 (1.3%)
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  - 2.7 (0.8%) $\downarrow$ for Arts tutoring, 1.7 (1.5%) $\downarrow$ for Sports tutoring
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- At least 3 million job opening losses in four months
- About 70,000 firm closures in 18 months
- At least 11 billion VAT losses in 18 months

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- Entrepreneurial activities and firm behavior over business cycles
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  - Tutoring, inequality, and overcompetition
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  Consider supply-side issue

- Impact of the DR Policy
  - Many aspects of the policy, but no quantitative studies at all
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  First to consider the economic impact of the DR Policy in a quantitative causal analysis

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Background: Overcompetition in China's Education System

- Confucianism culture and the education fever in East Asia
- Limited high education resources
  Enrollment rate for 985 project colleges: 2%
- Imbalance between education demand and supply
- Highly competitive exam-based admission
  High School Entrance Exam (HSEE) → College Entrance Exam (CEE)
- Better kindergarten → Better primary school → Better middle school → Better high school → Better college: Competition from Age 1

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- To win the battle of the HSEE and the CEE: Massive investment on shadow education
- Annual expenditure on private tutoring per family: 3,296 RMB (18% of income per capita) (Guo and Qu, 2022)
- Average time spent on private tutoring per week: 4.56 hours (Guo and Qu, 2022)

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- The education arm race gives rise to the private tutoring industry
- Over 800 billion RMB in industry value, 137 million student enrollment, 10 million+ labor force, before the DR Policy
- Most of the workers are young college graduates
- Several giant corporations: New Oriental, TAL etc.

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  - Overinvestment in private tutoring damages children's physical and mental health
  - High price of private tutoring leads to education inequality
- Possible reason for the abrupt plunge in fertility rate
- Chinese government decides to totally ban this industry

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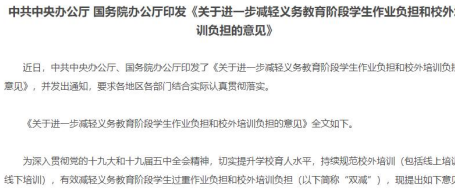
- Chinese government decides to totally ban this industry

Background: Private Tutoring Industry in China

- Two issues attract public attention
  - Overinvestment in private tutoring damages children's physical and mental health
  - High price of private tutoring leads to education inequality
- Possible reason for the abrupt plunge in fertility rate
- Chinese government decides to totally ban this industry

Background: The Double Reduction Policy

- The Double Reduction Policy was annouced in July 24th, 2021
  Opinions on Further Reducing the Homework Burden and Off-Campus Training Burden of Students in Compulsory Education



中共中央办公厅 国务院办公厅印发《关于进一步减轻义务教育阶段学生作业负担和校外培训负担的意见》

近日，中共中央办公厅、国务院办公厅印发了《关于进一步减轻义务教育阶段学生作业负担和校外培训负担的意见》，并发出通知，要求各地区各部门结合实际认真贯彻落实。

《关于进一步减轻义务教育阶段学生作业负担和校外培训负担的意见》全文如下。

为深入贯彻党的十九大和十九届五中全会精神，切实提升学校育人水平，持续规范校外培训（包括线上培训和线下培训），有效减轻义务教育阶段学生过重作业负担和校外培训负担（以下简称“双减”），现提出如下意见。

Background: The Double Reduction Policy

- Strict regulation on private tutoring
- Each province is required to submit reports of implementing the DR Policy twice in each month
- This is the LARGEST education policy in China in recent years

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  - Private tutoring firms can only register as non-profit organizations
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  1. Online job posting data from several platforms
  2. Firm registration data

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Data: Online Job Posting Data

- From six major online job recruitment platforms
  Zhaopin, 51job (qianchengwuyou), 58.com, Ganji, Lagou, Liepin
- Approximately 500 million entries from Jan 2016 to Nov 2021
- Scrap from their webs, remove all duplicated entries
- Information: job title, job description, company name, company profile, job location, posting date, salary
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- Construct a dictionary-based algorithm to search for academic tutoring firms
- Step 1: Identify candidate firms matching with a full list of keywords
  jiaoyu, peixun, fudao etc.
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- Firm registration dataset is scrapped from Tianyancha
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In the main regression, we consider four broad categories of firms

- 1. All education and training firms (education-related)
- 2. Academic private tutoring firms, directly affected by the DR Policy
- 3. Large private tutoring corporations
- 4. Firms engaged in home tutoring (jiajiao)

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To investigate the spillover effect, we further categorize non-academic firms into seven types

- 1. Arts tutoring firms
- 2. Certification exam tutoring firms (CPA, CFA etc.)
- 3. Civil servant exam tutoring firms (kao gong)
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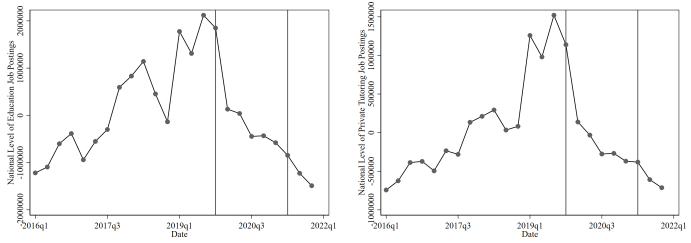
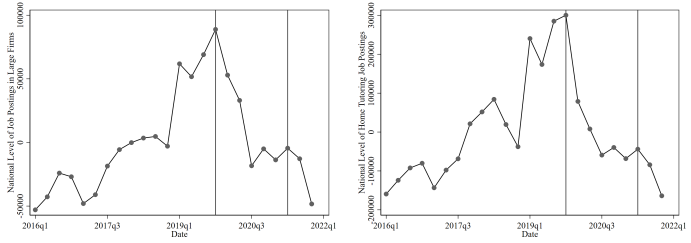
Descriptive Analysis: Job Posting



(a) Education (b) Tutoring

Figure: Changes of Job Postings in Numbers (2016 Q1 to 2021 Q4)

Descriptive Analysis: Job Posting



(a) Large (b) Home

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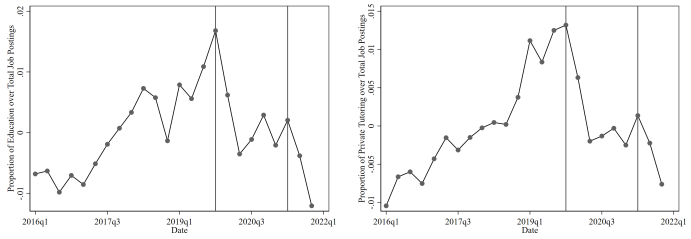

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Figure: Changes of Job Postings in Proportions (2016 Q1 to 2021 Q4)

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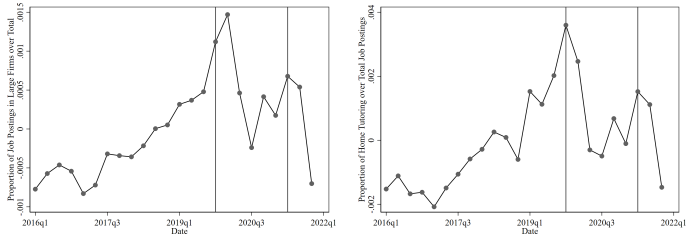

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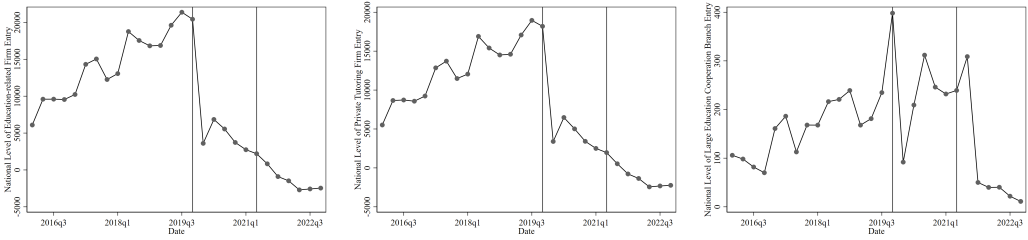
Descriptive Analysis: Job Posting

Table: Changes of Job Postings from May to November in 2021

Month	(1) Education	(2) Private Tutoring	(3) Large	(4) Home Tutoring
May	441348	198431	18456	55827
June	454689	211854	15256	62071
July	509015	240556	19114	68254
August	300803	115455	13278	41041
September	140552	61034	5483	20533
October	131163	59680	2681	15030
November	98109	25386	1146	7614
Changes (Jul to Nov)	-80.7%	-89.4%	-94.0%	-88.9%

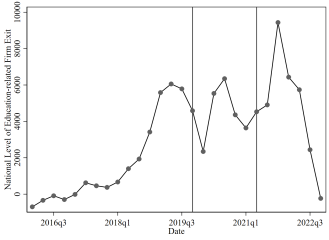
Descriptive Analysis: Firm Entry



(a) Education (b) Tutoring (c) Large

Figure: Changes of Firm Entries (2016 Q1 to 2021 Q4)

Descriptive Analysis: Firm Exit



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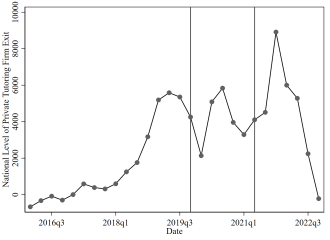
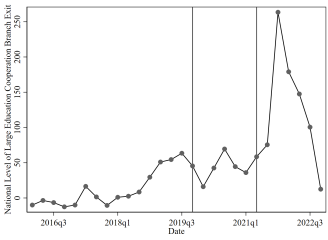


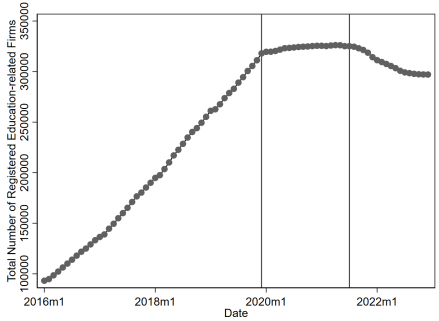
(b) Tutoring



(c) Large

Figure: Changes of Firm Exits (2016 Q1 to 2021 Q4)

Descriptive Analysis: Total Firm Registrations



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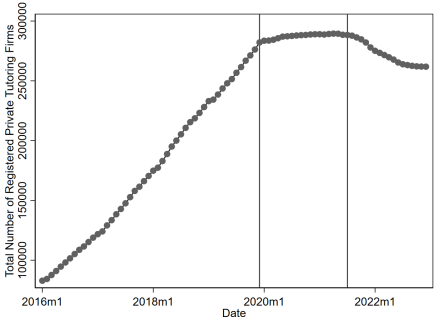
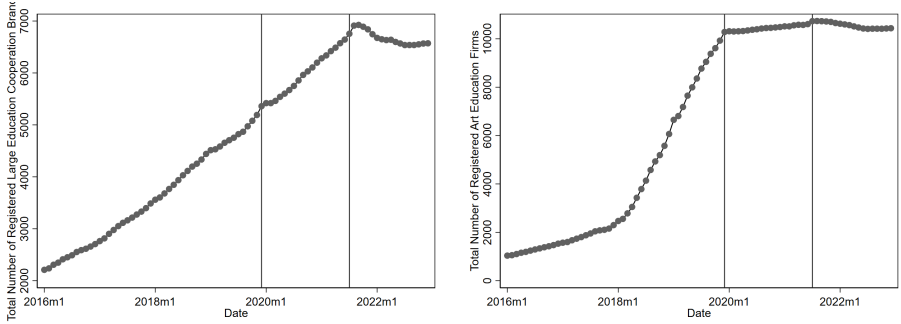


(b) Tutoring

Figure: Changes of Total Registered Firms (Jan 2016 to Dec 2022)

Descriptive Analysis: Total Firm Registrations



(a) Large

(b) Art

Figure: Changes of Total Registered Firms (Jan 2016 to Dec 2022)

Descriptive Analysis: Firm

Table: Changes of Firm Registrations

Month	(1) Education	(2) Private Tutoring	(3) Large
Panel A. Entry			
July 2021	1696	1384	130
December 2021	764	719	36
December 2022	117	93	16
Panel B. Exit			
July 2021	1711	1558	18
December 2021	5150	4851	130
December 2022	214	202	12
Panel C. Total Registration			
July 2021	325138	288331	6755
December 2021	314277	277913	6746
December 2022	297078	261824	6571

Regression Analysis: Empirical Strategy

- A DID exposure design to causally identify the impact of the DR Policy
- For city i in year t month m:

$$y_{itm} = \beta_0 + \beta_1 \text{policy}_{tm} \times \text{children}_i + \text{COVID}_{itm} + \eta_i + \gamma_{tm} + \delta_{im} + \epsilon_{itm} \quad (1)$$

- y_{itm}: number of online job recruitments, number of firm entries,exits and survival
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- y_{itm}: number of online job recruitments, number of firm entries,exits and survival
- policy_{tm}: $=1$ if the time period is after July 2021
- children_i: number of children aged 5 to 14 in 2020 for city i, unit is 1,000
- COVID_{itm}: number of active COVID-19 cases in city i during period tm

Regression Analysis: Empirical Strategy

- A DID exposure design to causally identify the impact of the DR Policy
- For city i in year t month m:

$$y_{itm} = \beta_0 + \beta_1 \text{policy}_{tm} \times \text{children}_i + \text{COVID}_{itm} + \eta_i + \gamma_{tm} + \delta_{im} + \epsilon_{itm} \qquad (1)$$

- y_{itm}: number of online job recruitments, number of firm entries,exits and survival
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Regression Analysis: Regression Results on Job Postings

Table: The Double Reduction Policy Effect on Job Postings

	Education		Private Tutoring		Large		Home	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Policy × children	-5.239***	-4.825***	-2.234***	-2.045***	-0.177**	-0.132**	-0.541***	-0.457***
	(1.308)	(1.212)	(0.483)	(0.453)	(0.0795)	(0.0548)	(0.127)	(0.1000)
COVID-19 Control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year-Month FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
City FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
City-Month FE	No	Yes	No	Yes	No	Yes	No	Yes
Observations	23,720	23,720	23,720	23,720	23,720	23,720	23,720	23,720
R-squared	0.700	0.723	0.568	0.588	0.493	0.537	0.577	0.611

Regression Analysis: Regression Results on Job Postings

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Regression Analysis: Regression Results on Job Postings

Table: Policy Effect on Job Postings Proportion (Over Total Postings)

	Education		Private Tutoring		Large		Home	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Policy × children	-0.00128	-0.00116	-0.00203***	-0.00201***	-0.000582**	-0.000599**	-0.00255***	-0.00260***
	(0.000785)	(0.000785)	(0.000711)	(0.000723)	(0.000241)	(0.000243)	(0.000720)	(0.000730)
COVID-19 Control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year-Month FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
City FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
City-Month FE	No	Yes	No	Yes	No	Yes	No	Yes
Observations	23,698	23,698	23,698	23,698	23,698	23,698	23,698	23,698
R-squared	0.288	0.381	0.280	0.367	0.104	0.221	0.142	0.256

Regression Analysis: Regression Results on Job Postings

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	(0.000785)	(0.000785)	(0.000711)	(0.000723)	(0.000241)	(0.000243)	(0.000720)	(0.000730)
COVID-19 Control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year-Month FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
City FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
City-Month FE	No	Yes	No	Yes	No	Yes	No	Yes
Observations	23,698	23,698	23,698	23,698	23,698	23,698	23,698	23,698
R-squared	0.288	0.381	0.280	0.367	0.104	0.221	0.142	0.256

Regression Analysis: Regression Results on Job Postings

Table: The Double Reduction Policy Effect on Private Tutoring Firms by Occupation

	Teaching Position		Non-teaching Position	
	(1)	(2)	(3)	(4)
Policy × children	-0.909***	-0.826***	-1.325***	-1.219***
	(0.152)	(0.133)	(0.339)	(0.328)
COVID-19 Control	Yes	Yes	Yes	Yes
Year-Month FE	Yes	Yes	Yes	Yes
City FE	Yes	Yes	Yes	Yes
City-Month FE	No	Yes	No	Yes
Observations	23,720	23,720	23,720	23,720
R-squared	0.685	0.705	0.488	0.510

Regression Analysis: Regression Results on Job Postings

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COVID-19 Control	Yes	Yes	Yes	Yes
Year-Month FE	Yes	Yes	Yes	Yes
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Observations	23,720	23,720	23,720	23,720
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Regression Analysis: Regression Results on Job Postings

An increase of 10 thousand children in a city (2 percent) leads to a monthly job opportunities loss of

- 50 (3.7 percent) for all education firms
- 20 (3.2 percent) for academic tutoring firms
- 1.3 (2.9 percent) for large tutoring corporations
- 4.6 (2.5 percent) for firms involved in home tutoring

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Regression Analysis: Regression Results on Firm Registrations

Table: Policy Effect on Firm Entry

	Education		Private Tutoring		Large		Home	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Policy × children	-0.0277***	-0.0304***	-0.0246***	-0.0268***	-0.0000879	-0.0000774	-0.0000549***	-0.0000576**
	(0.00663)	(0.00714)	(0.00649)	(0.00701)	(0.000239)	(0.000235)	(0.0000201)	(0.0000242)
COVID-19 Control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year-Month FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
City FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
City-Month FE	No	Yes	No	Yes	No	Yes	No	Yes
Observations	28,008	28,008	28,008	28,008	28,008	28,008	28,008	28,008
R-squared	0.703	0.725	0.711	0.732	0.596	0.624	0.162	0.252

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Regression Analysis: Regression Results on Firm Registrations

An increase of 10 thousand children in a city (2 percent) leads to a monthly firm entry decrease of

- 0.3 (5.9 percent) for all education firms
- 0.3 (6.7 percent) for academic tutoring firms
- 0.00077 (0.26 percent) for large tutoring corporations
- 0.00058 (2.1 percent) for firms involved in home tutoring

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Regression Analysis: Regression Results on Firm Registrations

Table: Policy Effect on Firm Exit

	Education		Private Tutoring		Large		Home	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Policy × children	0.00856***	0.00987***	0.00801***	0.00920***	0.000359*	0.000396**	0.0000243	0.0000372**
	(0.00231)	(0.00233)	(0.00229)	(0.00232)	(0.000187)	(0.000199)	(0.0000184)	(0.0000189)
COVID-19 Control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year-Month FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
City FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
City-Month FE	No	Yes	No	Yes	No	Yes	No	Yes
Observations	28,008	28,008	28,008	28,008	28,008	28,008	28,008	28,008
R-squared	0.645	0.685	0.641	0.680	0.269	0.331	0.166	0.281

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Regression Analysis: Regression Results on Firm Registrations

An increase of 10 thousand children in a city (2 percent) leads to a monthly firm exit increase of

- 0.1 (1.3 percent) for all education firms
- 0.092 (1.3 percent) for academic tutoring firms
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Regression Analysis: Dynamic Effects

- We utilize an event study regression to capture the dynamic effects

$$y_{itm} = \beta_0 + \sum_{tm} \beta_{tm} \mathbf{1(tm)} \times \text{children}_i + \text{COVID}_{itm} + \eta_i + \gamma_{tm} + \delta_{im} + \epsilon_{itm} \quad (2)$$

- This regression also allows us to check the pre-trends

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Regression Analysis: Dynamic Effects

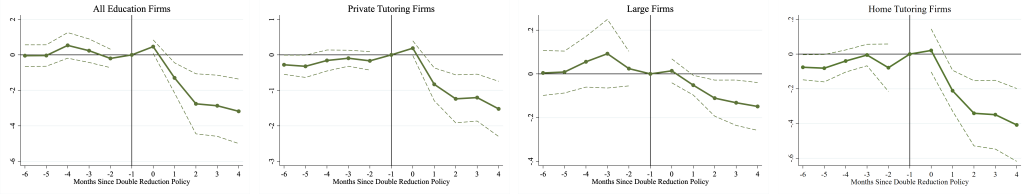


Figure: Dynamic Effects on Job Postings

Regression Analysis: Dynamic Effects

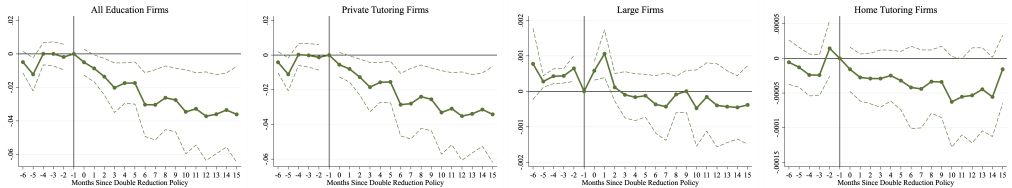
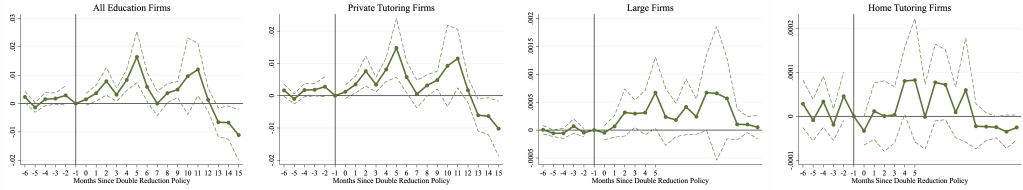


Figure: Dynamic Effects on Firm Entry

Regression Analysis: Dynamic Effects



(a) (b) (c) (d)

Figure: Dynamic Effects on Firm Exit

Regression Analysis: Spillover on Untargeted Tutoring

- Along with the DR Policy, gov is encouraging extracurricular activities and trainnings
- Will firms involved in arts, sports tutoring be harmed?
- It seems that not only private academic tutoring firms are the victims: In main table we have effect of All Edu ¿ Private Tutor
- Now let's try to categorize untargeted firms into more details

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Regression Analysis: Spillover on Untargeted Tutoring

Table: Spillover on Untargeted Firms

	(1) Arts	(2) Certificate	(3) Civil	(4) Adult	(5) Graduate	(6) Sports	(7) Talent
Policy × children	-0.270*	0.0580	0.00352	-0.00779	0.0203	-0.167*	-0.470**
	(0.143)	(0.0720)	(0.00729)	(0.0289)	(0.0182)	(0.0906)	(0.234)
COVID-19 Control	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year-Month FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
City FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
City-Month FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	23,720	23,720	23,720	23,720	23,720	23,720	23,720
R-squared	0.234	0.208	0.187	0.286	0.191	0.351	0.284

Regression Analysis: Spillover on Untargeted Tutoring

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COVID-19 Control	Yes	Yes	Yes	Yes	Yes	Yes	Yes
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Regression Analysis: Spillover on Untargeted Tutoring

Table: Spillover on Untargeted Firms: Firm Entry

	(1) Arts	(2) Certificate	(3) Civil	(4) Adult	(5) Graduate	(6) Sports	(7) Talent
Policy × children	-0.0236**	0.00348**	-6.81e-06***	-0.00457***	-3.55e-05*	-0.00734	-0.0256**
	(0.0104)	(0.00167)	(2.41e-06)	(0.00153)	(1.85e-05)	(0.00519)	(0.0120)
COVID-19 Control	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year-Month FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
City FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
City-Month FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	28,008	28,008	28,008	28,008	28,008	28,008	28,008
R-squared	0.649	0.686	0.165	0.444	0.178	0.565	0.665

Regression Analysis: Spillover on Untargeted Tutoring

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	(1) Arts	(2) Certificate	(3) Civil	(4) Adult	(5) Graduate	(6) Sports	(7) Talent
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	(0.0104)	(0.00167)	(2.41e-06)	(0.00153)	(1.85e-05)	(0.00519)	(0.0120)
COVID-19 Control	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year-Month FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
City FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
City-Month FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	28,008	28,008	28,008	28,008	28,008	28,008	28,008
R-squared	0.649	0.686	0.165	0.444	0.178	0.565	0.665

Regression Analysis: Spillover on Untargeted Tutoring

Table: Spillover on Untargeted Firm: Firm Exit

	(1) Arts	(2) Certificate	(3) Civil	(4) Adult	(5) Graduate	(6) Sports	(7) Talent
Policy × children	0.00956***	0.00233***	1.31e-06	0.00130***	4.50e-06	0.00546***	0.0117***
	(0.00342)	(0.000392)	(2.84e-06)	(0.000424)	(5.21e-06)	(0.00162)	(0.00372)
COVID-19 Control	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year-Month FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
City FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
City-Month FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	28,008	28,008	28,008	28,008	28,008	28,008	28,008
R-squared	0.642	0.360	0.145	0.652	0.145	0.575	0.649

Regression Analysis: Spillover on Untargeted Tutoring

Table: Spillover on Untargeted Firm: Firm Exit

	(1) Arts	(2) Certificate	(3) Civil	(4) Adult	(5) Graduate	(6) Sports	(7) Talent
Policy × children	0.00956***	0.00233***	1.31e-06	0.00130***	4.50e-06	0.00546***	0.0117***
	(0.00342)	(0.000392)	(2.84e-06)	(0.000424)	(5.21e-06)	(0.00162)	(0.00372)
COVID-19 Control	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year-Month FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
City FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
City-Month FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
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Regression Analysis: Spillover on Untargeted Tutoring

- We find very significant unintended negative spillovers on untargeted firms
- Among untargeted firms, arts and sports tutoring firms are hurt the most
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  - Intensified Regulation: the whole private tutoring industry is under scrutinization
  - Chilling Effect: When the nest is upset, no egg is left unbroken

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Regression Analysis: Where Have All the Bosses Gone

- Many investors decide to cancel their firms and quit the private tutoring business
- Where are they going after that?
- We link these former private tutoring business investors to new firms established after the DR Policy

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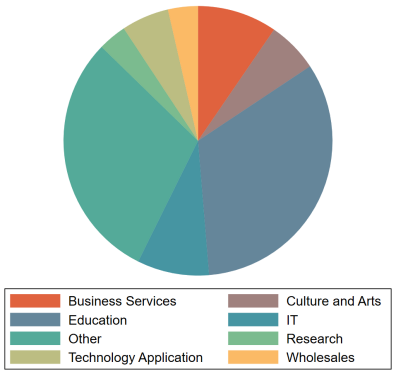

Figure: New Firms Owned by Former Tutoring Firm Shareholders

Regression Analysis: Where Have All the Bosses Gone

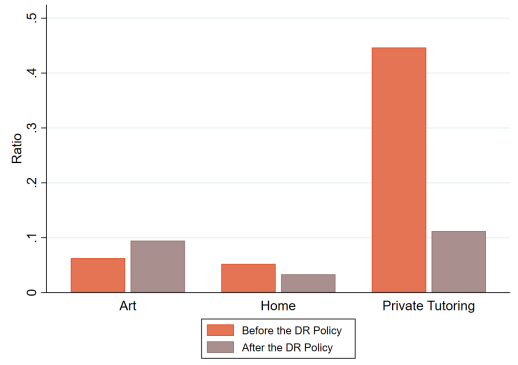

Figure: Types of Education-related Firms Owned by Former Tutoring Firm Shareholders

Regression Analysis: Concluding Remarks

- Cities with higher exposure to the DR Policy $\Rightarrow$ online job postings $\downarrow$, firm entries $\downarrow$, firm exits $\uparrow$.
- Not only private academic tutoring firms, but other firms, are severely impacted. Negative spillover effects on untargeted firms.
- Large tutoring corporations do not show better resilience than smaller, independent firms.
- Firms involved in art and sports tutoring are also negatively affected.
- The majority of former tutoring firm owners continue to operate within the education sector, but specifically avoid engagement in private tutoring activities.

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Robustness Check

- Using the number of advertisement postings as outcome ▸ Advertisement
- Including July in the treatment group ▸ Include July
- Treatment starts from May ▸ Start from May
- COVID-19 Effect ▸ COVID-19 Effect

Back-of-envelope Calculation: Method

What are the overall losses?

- Setting Policy $\times$ children to zero to have a predicted number of job postings (surviving firms)
- Use actual number to abstract the predicted number
- (Lower bound) Tax loss = firm loss $\times$ median VAT paid by education firm
- VAT data comes from the China Taxation Survey in 2016

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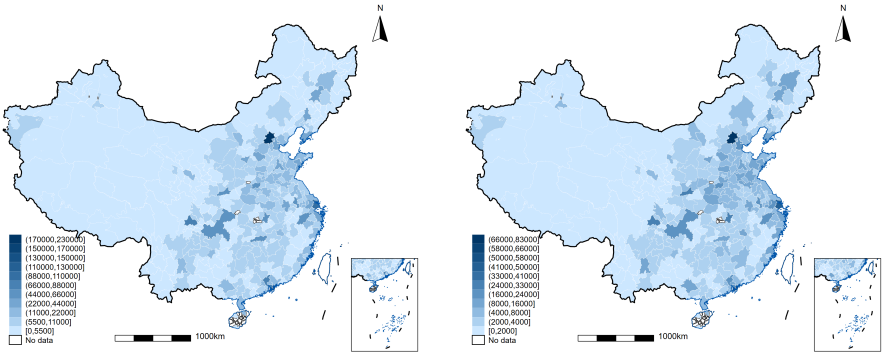
Back-of-envelope Calculation: Geographical Distribution of Losses

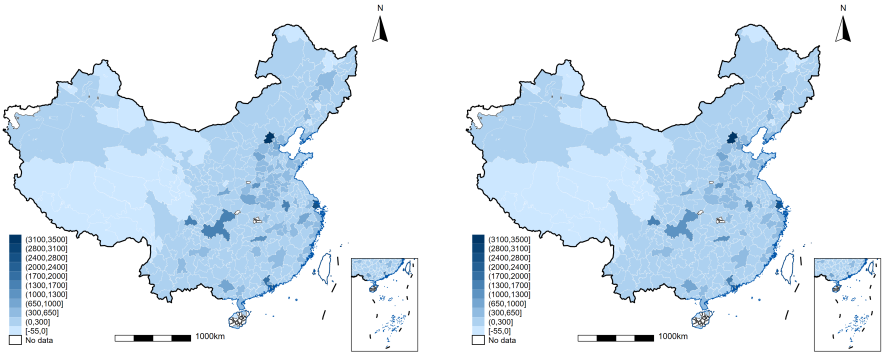


(a) Education

(b) Tutoring

Figure: Predicted City-level Loss of Job Postings

Back-of-envelope Calculation: Geographical Distribution of Losses



(a) Education

(b) Tutoring

Figure: Predicted City-level Loss of Firms

Back-of-envelope Calculation: National

What are the national level losses?

- National level job opportunity loss: 3.4 million for all education-related firms, 1.4 million for academic private tutoring firms in 4 months
- National level firm loss: 70,000 for all education-related firms, 62,400 for academic private tutoring firms in 18 months
- National level tax loss: At least 11 billion RMB in 18 months

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Conclusion

- We investigate the economic consequences of the DR Policy in China
- The DR Policy causes a sharp plummet of number of firms operating in the education sector, leading to significant losses in job opportunities and tax revenue
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Robustness Checks: On Number of Advertisement Postings

Table: The Double Reduction Policy Effect on Advertisement Postings

	Education		Private Tutoring		Large		Home	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Policy × children	-1.259***	-1.159***	-0.480***	-0.442***	-0.0389**	-0.0320**	-0.105***	-0.0916***
	(0.319)	(0.293)	(0.102)	(0.0946)	(0.0184)	(0.0146)	(0.0229)	(0.0185)
COVID-19 Control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year-Month FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
City FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
City-Month FE	No	Yes	No	Yes	No	Yes	No	Yes
Observations	23,720	23,720	23,720	23,720	23,720	23,720	23,720	23,720
R-squared	0.719	0.737	0.580	0.599	0.580	0.610	0.627	0.655

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Robustness Checks: On Number of Advertisement Postings

Table: Policy Effect on Advertisement Postings Proportion (Over Total Postings)

	Education		Private Tutoring		Large		Home	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Policy × children	-0.000823	-0.000702	-0.000831	-0.000756	-0.000291**	-0.000296**	-0.00130***	-0.00131***
	(0.000679)	(0.000677)	(0.000508)	(0.000510)	(0.000145)	(0.000146)	(0.000494)	(0.000494)
COVID-19 Control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year-Month FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
City FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
City-Month FE	No	Yes	No	Yes	No	Yes	No	Yes
Observations	23,698	23,698	23,698	23,698	23,698	23,698	23,698	23,698
R-squared	0.357	0.443	0.371	0.447	0.080	0.208	0.111	0.237

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Robustness Checks: Including July

Table: Policy Effect on Job Postings – Including July in the Treatment Group

	Education		Tutoring		Large		Art		Home	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Policy × children	-4.675***	-4.509***	-1.969***	-1.862***	-0.152**	-0.109**	-0.405***	-0.420***	-0.474***	-0.408***
	(1.192)	(1.170)	(0.432)	(0.423)	(0.0700)	(0.0465)	(0.0782)	(0.0916)	(0.116)	(0.0950)
COVID-19 Control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year-Month FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
City FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
City-Month FE	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Observations	23,720	23,720	23,720	23,720	23,720	23,720	23,720	23,720	23,720	23,720
R-squared	0.700	0.723	0.568	0.589	0.493	0.537	0.073	0.258	0.576	0.611

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Robustness Checks: Including July

Table: Policy Effect on Job Postings Proportion – Including July in the Treatment Group

	Education		Private Tutoring		Large		Home	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Policy × children	-0.000832	-0.000732	-0.00151***	-0.00148***	-0.000463**	-0.000472**	-0.00205***	-0.00208***
	(0.000623)	(0.000628)	(0.000561)	(0.000568)	(0.000192)	(0.000193)	(0.000573)	(0.000581)
COVID-19 Control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year-Month FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
City FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
City-Month FE	No	Yes	No	Yes	No	Yes	No	Yes
Observations	23,698	23,698	23,698	23,698	23,698	23,698	23,698	23,698
R-squared	0.288	0.380	0.278	0.366	0.103	0.220	0.140	0.254

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Robustness Checks: Including July

Table: Policy Effect on Firm Entry – Including July in the Treatment Group

	Education		Private Tutoring		Large		Home	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Policy × children	-0.0265***	-0.0296***	-0.0237***	-0.0262***	-0.0000518	-0.0000459	-0.0000551***	-0.0000584**
	(0.00646)	(0.00706)	(0.00631)	(0.00689)	(0.000209)	(0.000202)	(0.0000204)	(0.0000239)
COVID-19 Control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year-Month FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
City FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
City-Month FE	No	Yes	No	Yes	No	Yes	No	Yes
Observations	28,008	28,008	28,008	28,008	28,008	28,008	28,008	28,008
R-squared	0.704	0.726	0.712	0.733	0.596	0.624	0.162	0.252

Back

Robustness Checks: Including July

Table: Policy Effect on Firm Exit – Including July in the Treatment Group

	Education		Private Tutoring		Large		Home	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Policy × children	0.00765***	0.00864***	0.00710***	0.00800***	0.000297**	0.000320**	0.0000119	0.0000275*
	(0.00215)	(0.00213)	(0.00214)	(0.00213)	(0.000149)	(0.000156))	(0.0000143)	(0.0000152)
COVID-19 Control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year-Month FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
City FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
City-Month FE	No	Yes	No	Yes	No	Yes	No	Yes
Observations	28,008	28,008	28,008	28,008	28,008	28,008	28,008	28,008
R-squared	0.645	0.685	0.641	0.680	0.268	0.330	0.166	0.281

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Robustness Checks: Treatment Starts from May

Table: Policy Effect on Job Postings – Treatment Starts from May

	Education		Private Tutoring		Large		Home	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Policy × children	-4.241***	-4.783***	-1.765***	-1.987***	-0.126*	-0.108**	-0.420***	-0.429***
	(1.103)	(1.224)	(0.389)	(0.435)	(0.0673)	(0.0545)	(0.108)	(0.106)
COVID-19 Control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year-Month FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
City FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
City-Month FE	No	Yes	No	Yes	No	Yes	No	Yes
Observations	23,720	23,720	23,720	23,720	23,720	23,720	23,720	23,720
R-squared	0.701	0.726	0.568	0.591	0.493	0.537	0.577	0.612

Back

Robustness Checks: Treatment Starts from May

Table: Policy Effect on Job Postings Proportion – Treatment Starts from May

	Education		Private Tutoring		Large		Home	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Policy × children	-0.000664	-0.000609	-0.00121***	-0.00117**	-0.000367***	-0.000369***	-0.00173***	-0.00175***
	(0.000509)	(0.000518)	(0.000464)	(0.000469)	(0.000139)	(0.000141)	(0.000468)	(0.000471)
COVID-19 Control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year-Month FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
City FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
City-Month FE	No	Yes	No	Yes	No	Yes	No	Yes
Observations	23,698	23,698	23,698	23,698	23,698	23,698	23,698	23,698
R-squared	0.287	0.380	0.278	0.365	0.103	0.220	0.139	0.253

Back

Robustness Checks: Treatment Starts from May

Table: Policy Effect on Firm Entry – Treatment Starts from May

	Education		Private Tutoring		Large		Home	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Policy × children	-0.0265***	-0.0296***	-0.0237***	-0.0262***	-0.0000518	-0.0000459	-0.0000551***	-0.0000584***
	(0.00646)	(0.00706)	(0.00631)	(0.00689)	(0.000209)	(0.000202)	(0.0000204)	(0.0000239)
COVID-19 Control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year-Month FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
City FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
City-Month FE	No	Yes	No	Yes	No	Yes	No	Yes
Observations	28,008	28,008	28,008	28,008	28,008	28,008	28,008	28,008
R-squared	0.704	0.726	0.712	0.733	0.596	0.624	0.162	0.252

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Robustness Checks: Treatment Starts from May

Table: Policy Effect on Firm Exit – Treatment Starts from May

	Education		Private Tutoring		Large		Home	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Policy × children	0.00765***	0.00864***	0.00710***	0.00800***	0.000297**	0.000320**	0.0000119	0.0000275*
	(0.00215)	(0.00213)	(0.00214)	(0.00213)	(0.000149)	(0.000156)	(0.0000143)	(0.0000152)
COVID-19 Control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year-Month FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
City FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
City-Month FE	No	Yes	No	Yes	No	Yes	No	Yes
Observations	28,008	28,008	28,008	28,008	28,008	28,008	28,008	28,008
R-squared	0.645	0.685	0.641	0.680	0.268	0.330	0.166	0.281

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Robustness Checks: COVID-19 Effect

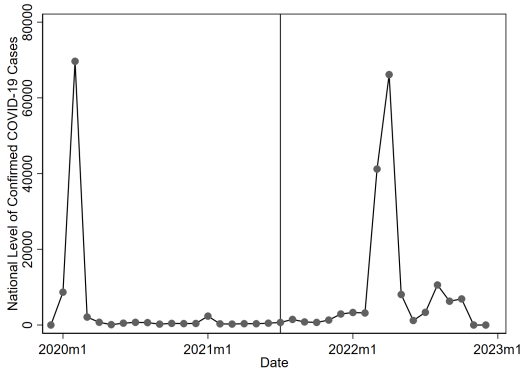

Figure: Number of Confirmed COVID-19 Cases in China (Dec. 2019 to Dec. 2022)

Robustness Checks: COVID-19 Effect

Table: Correlation Between Policy and COVID-19 Cases

	Until Dec. 2021		Until Dec. 2022	
	(1)	(2)	(3)	(4)
Policy × children	-0.0205	0.00404	-0.0522	-0.00292
	(0.0202)	(0.00374)	(0.0334)	(0.00696)
Year-Month FE	Yes	Yes	Yes	Yes
City FE	Yes	Yes	Yes	Yes
City-Month FE	No	Yes	No	Yes
Observations	8,175	8,175	12,216	12,117
R-squared	0.054	0.503	0.043	0.339

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