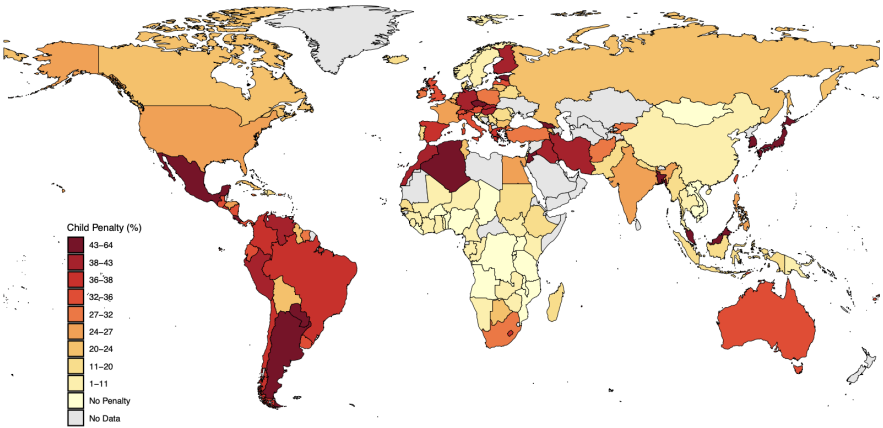
Free Childcare and the Motherhood Penalty: Evidence from São Paulo

João Garcia Rafael Latham-Proença Marcela Mello

Applied Micro Lunch



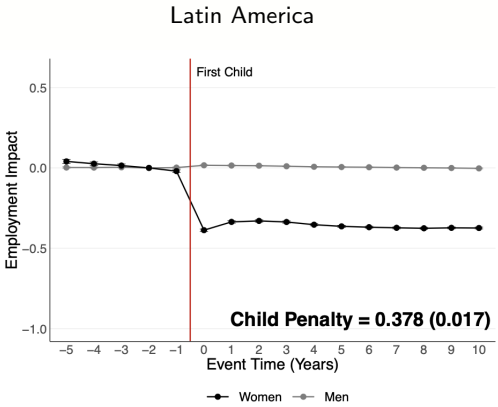
Child penalty across the world (Kleven, Landais & Leite-Mariante (2023))

Introduction

Literature on the child penalty has focused on developed countries

Latin America has largest child penalties in the world

Still little evidence about this context



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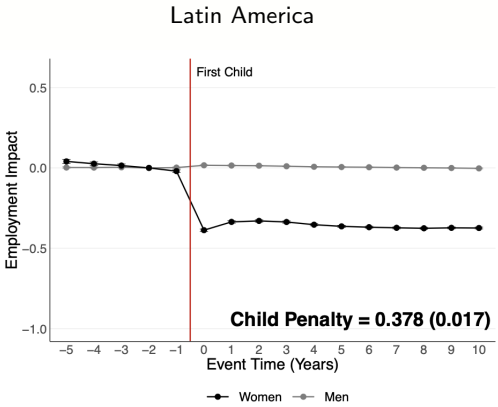

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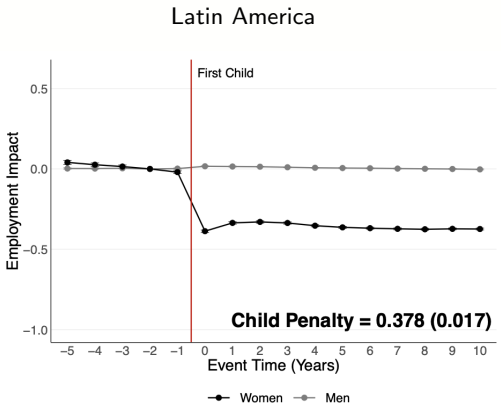

Introduction

What do we know about policies to reduce the child penalty?

Evaluations of subsidized childcare are mixed and context seems to matter

Several reasons why results from Austria may not carry over to Colombia

- Economic structure
- Labor market institutions
- Cultural norms

This paper

We study a large expansion of free childcare in the city of São Paulo.

Large scale implementation

- Added on average 30,000 new seats per year over one decade
- Coverage went from 25% to 75%

Child penalty fairly typical of LatAm

School district rules help with identification

Good data on labor and family structure

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This paper

Question: How does free childcare availability affect the child penalty?

Method: We leverage the rollout of free childcare in São Paulo, into a DID framework

Results: We find an increase from 0 to 1 seat per child in a district causes an increase of 6.4 p.p. in maternal employment in that district

Literature

- Female labor and the family

  Bertrand, Goldin and Katz (2010), Kleven, Goldin and Katz (2016), Landais and Sogaard (2019)

- Effects of childcare access

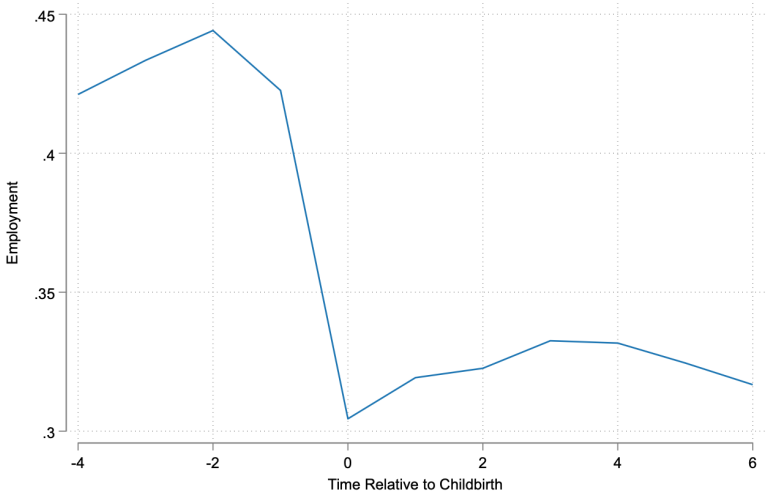
  Kleven et al. (2021), Andresen and Havnes (2019), Carta and Rizzica (2018), Haeck, Lefevbre and Marrigan (2015), Havnes and Mogstad (2011), Goux and Maurin (2010), Cascio (2009), Gruber and Milligan (2008),

- Childcare in Latin America

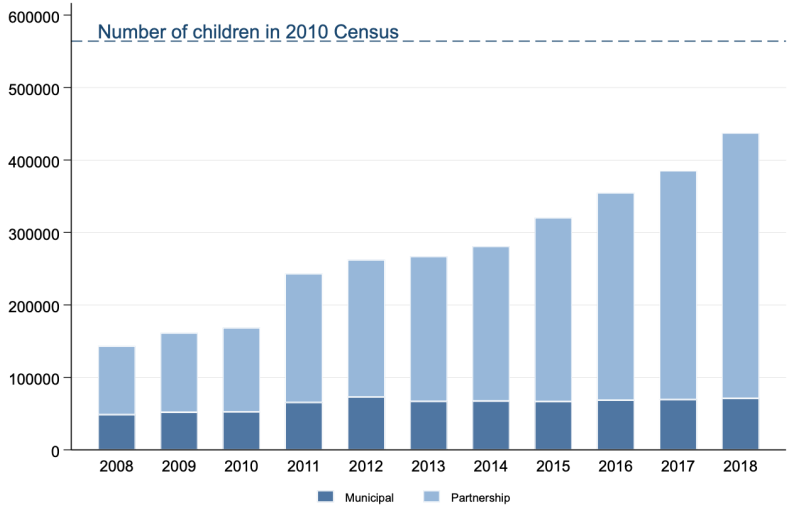
  Attanasio et al. (2022), Paes de Barros (2011), Rosero and Oosterbeek (2011), Calderón (2011), Berlinski (2011)

Setting

Setting: The Child Penalty in São Paulo



Setting: Enrollment



▸ Private Providers

Setting: Public-private-partnership model

City government:

- Finds and provides suitable location
- Hires childcare provider
- Pays by student

Private provider:

- Hires caretakers
- Handles day-to-day operation
- Helps find locations

High standard of quality

Flexibility allowed for fast expansion

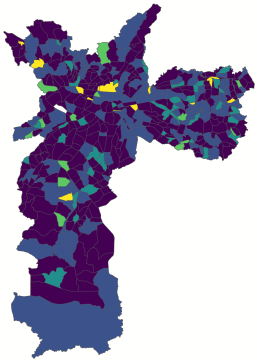
Childcare in Itaquera, São Paulo

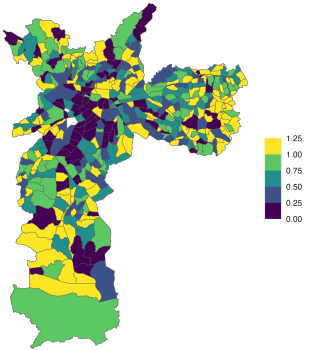
Setting

Allocation:

- Centralized online system to match child-facility
- Parents request a slot in a childcare facility
- Child-facility matching done in the same educational district, when available
- First-come-first-served
- Since 2013, priority to families living in extreme poverty

Seats per 0-3 year-old child in Census, 2008 and 2018





Data

Data Sources

Sample: Family rosters and addresses from the Single Registry - NOT representative

Outcomes: Labor data from RAIS, includes all formal employment links

Treatment: Data on childcare centers from the Municipal Government

Sample

Sample of

- Women
- Had their first child between 16 and 65 years old
- Living in the city of São Paulo
- In the Single Registry

Descriptive

Mothers of a first child one year of age or younger in 2010

Variable	Census	Single Registry
Share Compled HS	0.85	0.61
Share Born in Sao Paulo	0.66	0.53
Share White	0.62	0.40
Share Employed - Formal Sector	0.39	0.35
Share Employed - Informal Sector	0.28	?
Average Yearly Income - Formal Sector	24,878	6,326
Median Yearly Income - Formal Sector	14,400	6,169
N	88,452	45,875

	Mothers		Fathers	
	Before	After	Before	After
Share formally employed	0.44	0.33	0.57	0.55
	(0.11)	(0.09)	(0.17)	(0.16)
Total earnings (Yearly)	3,465	2,217	6,445	6,449
	(1,162)	(852)	(2,897)	(2,850)
Earnings if employed (Yearly)	7,749	6,607	11,314	11,741
	(1,567)	(1,656)	(3,714)	(3,973)
Work hours if employed (Weekly)	29.04	24.36	33.16	33.23
	(3.44)	(3.63)	(7.15)	(5.84)
Wage if employed (Hourly)	4.95	5.07	6.35	6.65
	(0.78)	(1.44)	(1.70)	(2.37)
N	306,841	401,033	64,088	78,599

Empirical Strategy

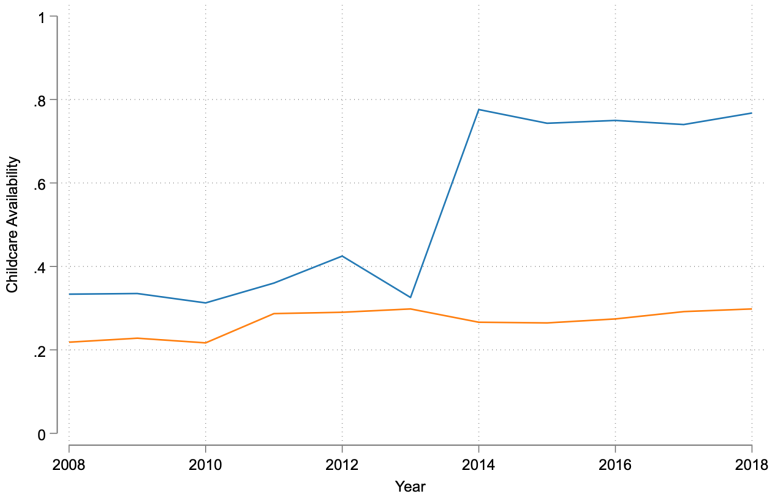
Empirical Strategy

We show two different strategies, emphasizing different comparisons

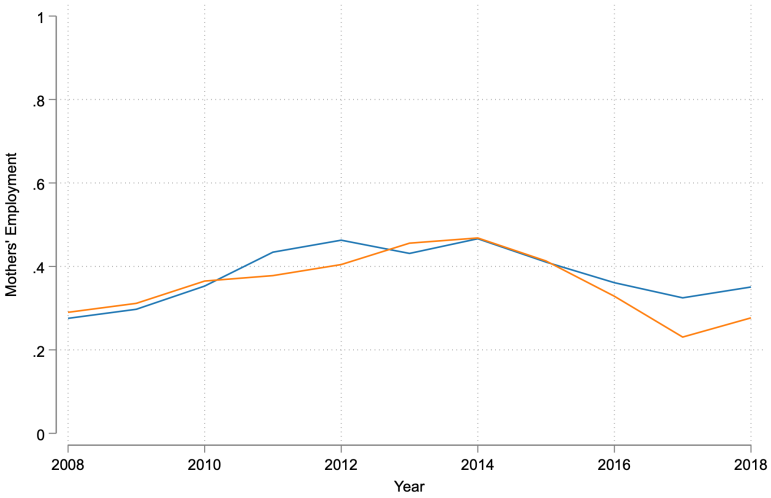
First, a comparison **between** districts with and without childcare expansion

Second, a comparison **within** districts, between mothers and mothers-to-be

Between Districts



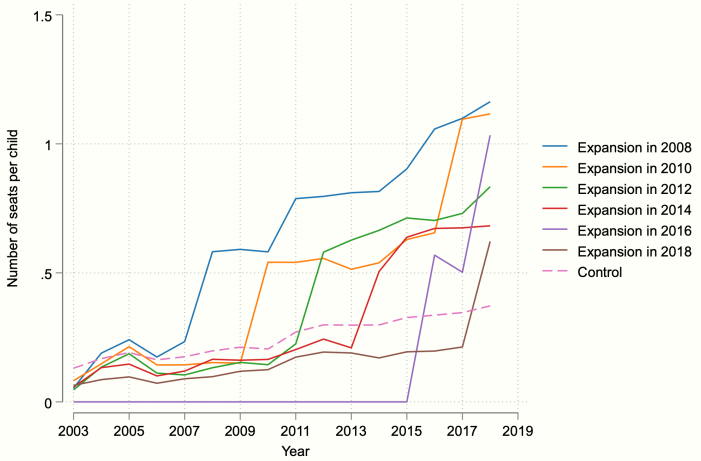
Between Districts



Empirical Strategy - Between Districts

- Expansion of childcare happened at different times in each district
- We compare places with rapid expansion to those with no significant expansion
- Calculate the largest annual increase in availability for each district over the period, $gmax_d$
- A district is considered **treated** if:
  - The first childcare facility opened during this period
  - $gmax_d$ is in the top 40% of distribution
- A district is in the **control** if $gmax_d$ is in the bottom 40%
- Districts with $gmax_d$ in the middle 20% are dropped from the comparison

Expansion of Childcare

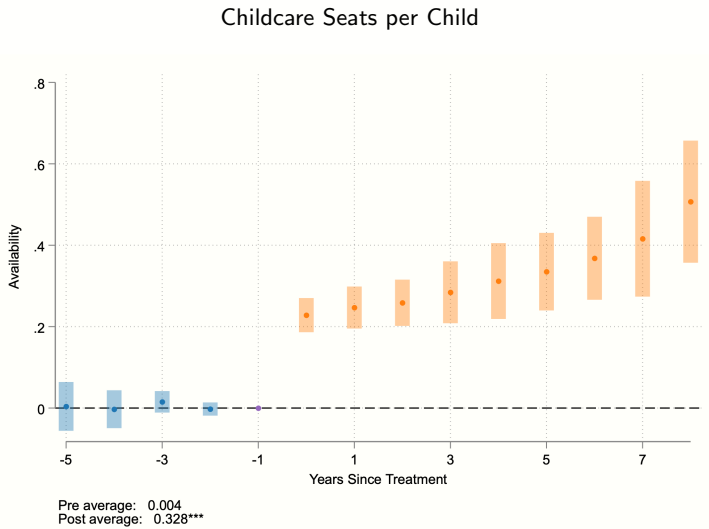


Absolute seats

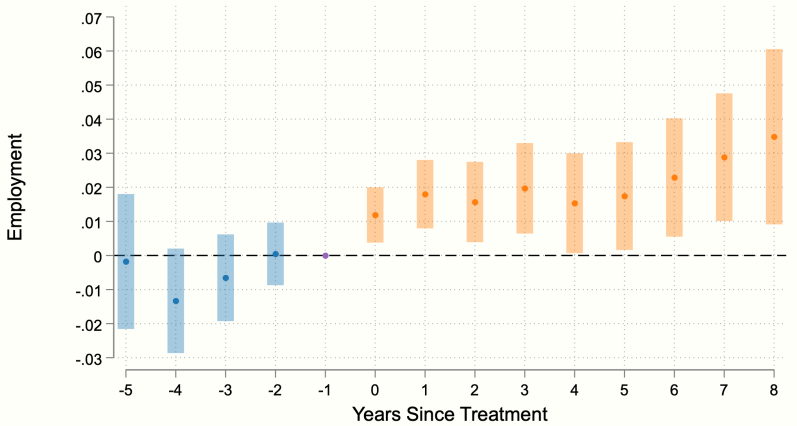
Estimation

- Main outcome: Employment and earnings of mothers 0 to 3 years since childbirth
- Estimation with Callaway and Sant'Anna (2021)
- First stage: effect of one expansion on availability (seats per child)
- Estimates of effect of the expansion can be rescaled to get the effect of availability

Main Results



Mothers' Employment

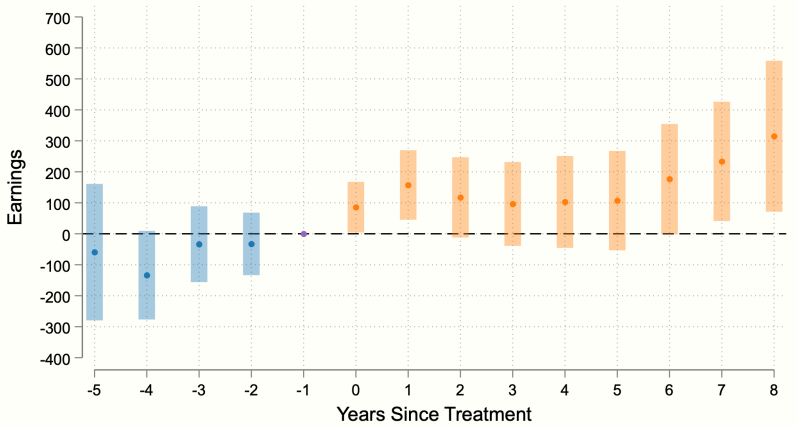


Extended

Treatment Definition

Pre average: -0.005
Post average: 0.021***
Pretrends p-value: 0.243
Pre = Post p-value: 0.009

Mothers' Earnings

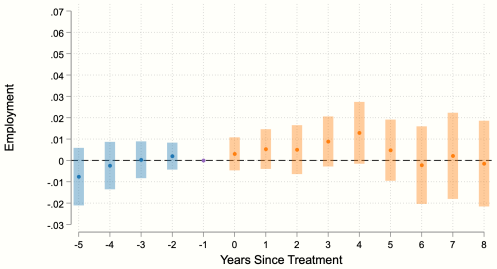


Extended

Treatment Definition

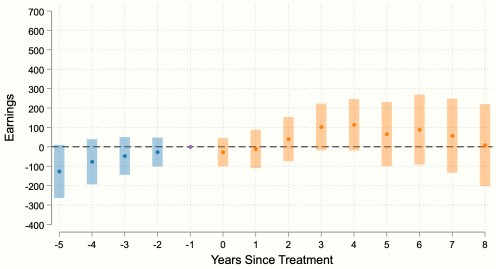
Pre average: -64.8
Post average: 154.7**
Pretrends p-value: 0.212
Pre = Post p-value: 0.031

Mothers-to-be Employment



Pre average: -0.002
Post average: 0.004
Pretrends p-value: 0.625
Pre = Post p-value: 0.441

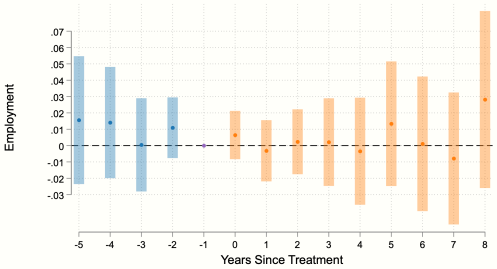
Mothers-to-be Earnings



Pre average: -69.3
Post average: 48.5
Pretrends p-value: 0.478
Pre = Post p-value: 0.150

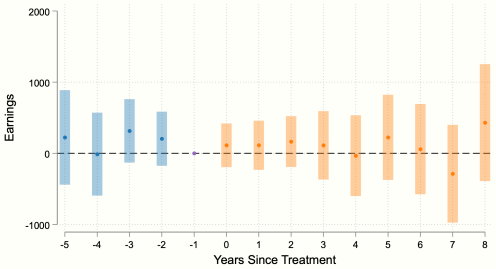
Extended

Fathers' Employment



Pre average: 0.010
Post average: 0.004
Pretrends p-value: 0.585
Pre = Post p-value: 0.741

Fathers' Earnings



Pre average: 182.9
Post average: 99.4
Pretrends p-value: 0.265
Pre = Post p-value: 0.792

Extended

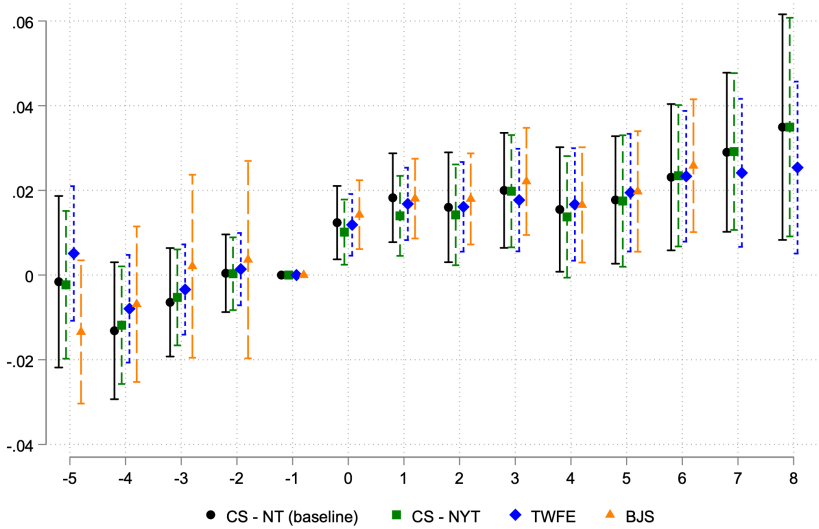
Main Results

Table: Effects of Childcare Expansion

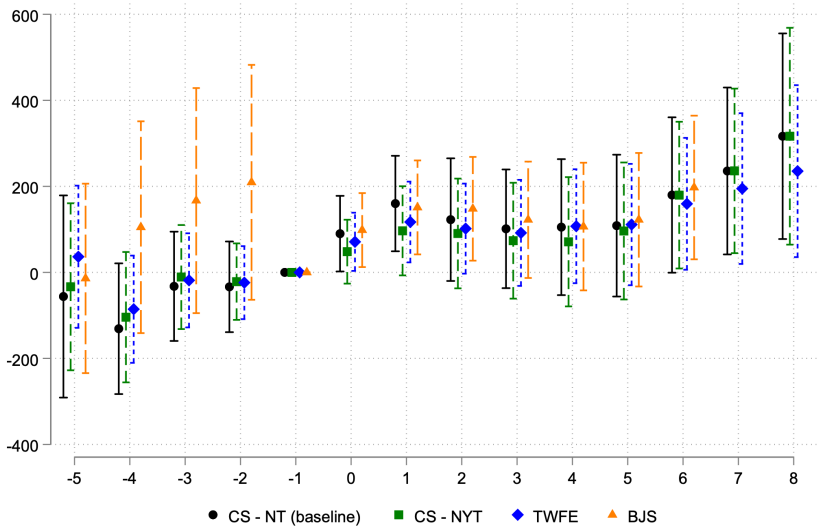
	Employment		Earnings	
	Pre	Post	Pre	Post
Mothers	−0.005	0.021***	−64.8	154.7**
	(0.006)	(0.007)	(63.1)	(65.9)
Mothers-to-be	−0.002	0.004	−69.3	48.5
	(0.004)	(0.006)	(47.3)	(59.5)
Fathers	0.010	0.004	182.9	99.4
	(0.012)	(0.014)	(219.0)	(221.5)

Notes: This table shows the average estimated effects for the Pre- and Post-expansion periods, for mothers, mothers-to-be and fathers. The mother and father samples include parents from 0 to 3 years after childbirth. The mothers-to-be sample includes 4 to 1 year before childbirth. Earnings in 2010 BRL. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Robustness: Mothers' Employment



Robustness: Mothers' Earnings



Alternative Strategy

Main potential issues with this strategy:

- Targeting of expansion may be correlated with unobserved labor market trends
- Falsification tests may be underpowered

We want an alternative that is robust to arbitrary trends in the local labor market

Within–District Strategy

Suppose there is only one district, where we observe mothers and mothers-to-be.

We can still use a DID design, if we assume mothers-to-be are not affected by childcare

Denote motherhood status m, time t. Suppose just 2 periods. Consider this regression:

$$Y_{m,t} = \alpha + \beta \cdot Availability_t \cdot 1\{m = 1\} + \gamma \cdot 1\{m = 1\} + \delta \cdot 1\{t = 1\} + u_{m,t}$$

Within–District Strategy

We build upon this intuition, and extend it in two ways

First, we use this strategy for all districts stacked

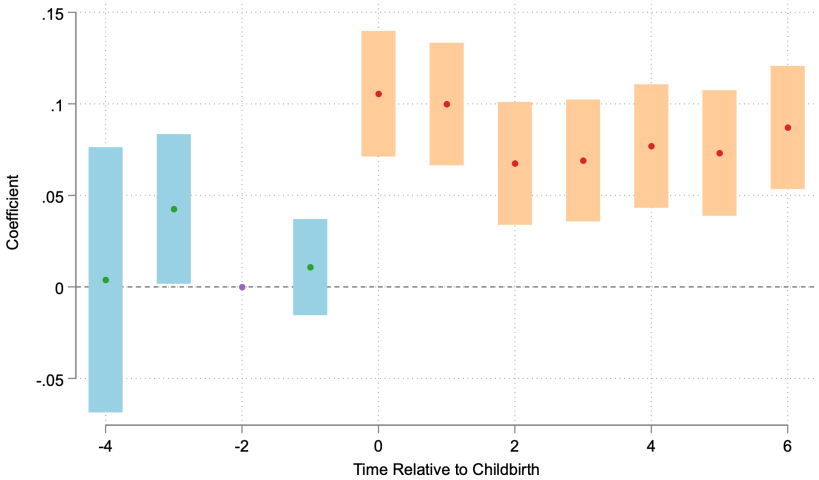
Second, we use time-from-childbirth instead of just a motherhood indicator

Within–District Strategy

Denote $Y_{d,t,\tau} = E[y_{i,t}|\text{district} = d, \text{time since childbirth} = \tau]$

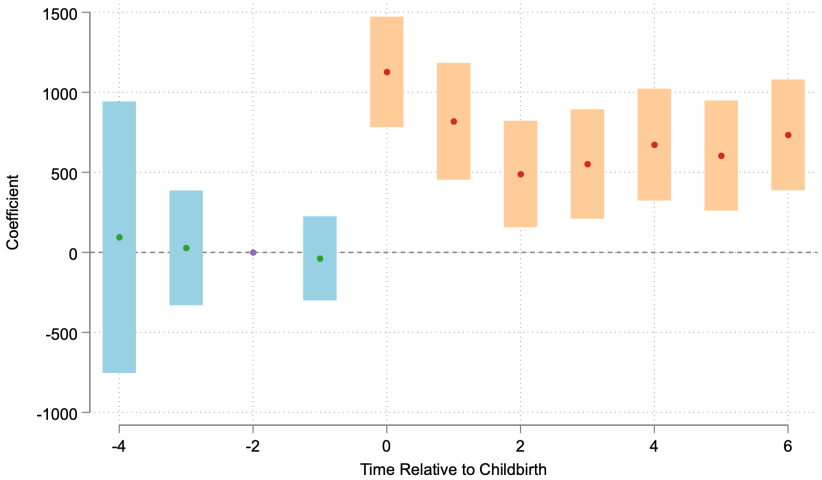
$$Y_{d,t,\tau} = \alpha_{d,\tau} + \gamma_{d,t} + \sum_{k \neq -2} \beta_k Availability_{d,t} \cdot 1\{\tau = k\} + \varepsilon_{d,t,\tau}$$

Mothers' Employment



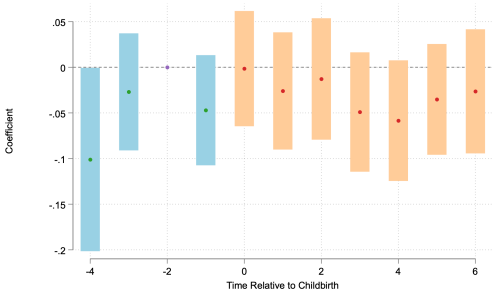
Pre-birth p-value: 0.2552
Pre = Post p-value: 0.0002

Mothers' Earnings



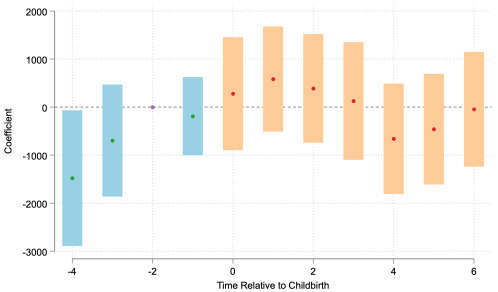
Pre-birth p-value: 0.8800
Pre = Post p-value: 0.0005

Fathers' Employment



Pre-birth p-value: 0.0532
Pre = Post p-value: 0.2059

Fathers' Earnings



Pre-birth p-value: 0.0706
Pre = Post p-value: 0.0618

Discussion

However, this is an **expensive** policy. Cost per child is close to one minimum wage

Can it be justified strictly in terms of costs compared to increased wages?

Key unknowns: (1) full persistence of effects, (2) effects on mothers out of the sample

Assuming same effects for all mothers, policy pays for itself if effects persist for **30 years**
This ignores potential benefits for the children, payments for private childcare, non-market benefits

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Conclusion

This paper studies the effects of free childcare on the motherhood penalty

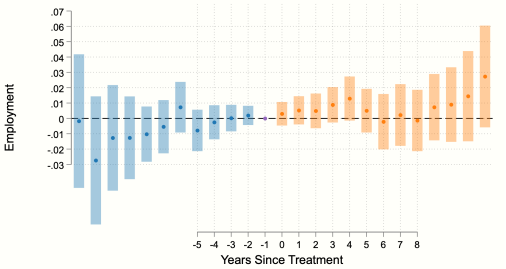
We leverage a large scale expansion in São Paulo in two complementary DID designs

We find full provision of childcare would increase mothers' employment by 6.4p.p., or roughly half the child penalty.

However, costs are high.

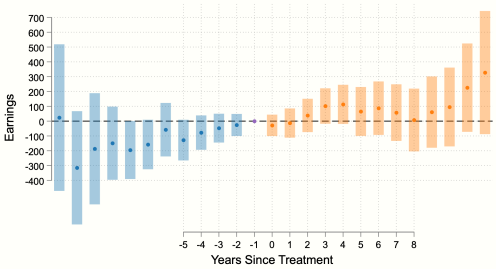
Happy Thanksgiving!

Mothers-to-be Employment



Pre average: -0.006
Post average: 0.007
Pretrends p-value: 0.263
Pre = Post p-value: 0.275

Mothers-to-be Earnings



Pre average: -119.6
Post average: 87.7
Pretrends p-value: 0.341
Pre = Post p-value: 0.132

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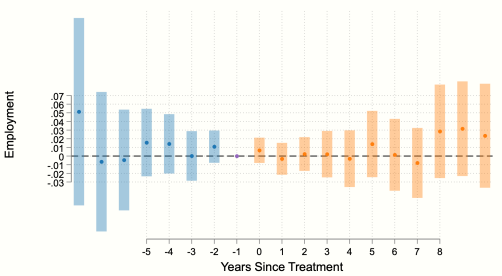
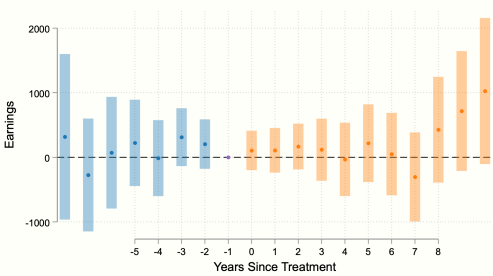
Fathers' Employment



Pre average: 0.012
Post average: 0.009
Pretrends p-value: 0.513
Pre = Post p-value: 0.915

Fathers' Earnings



Pre average: 120.0
Post average: 236.2
Pretrends p-value: 0.247
Pre = Post p-value: 0.776

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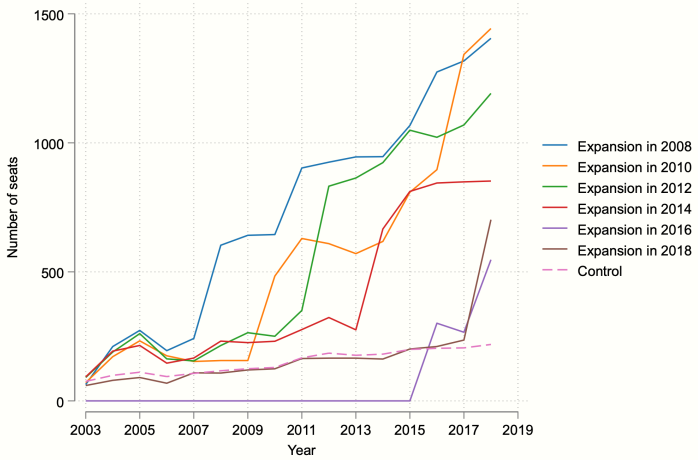
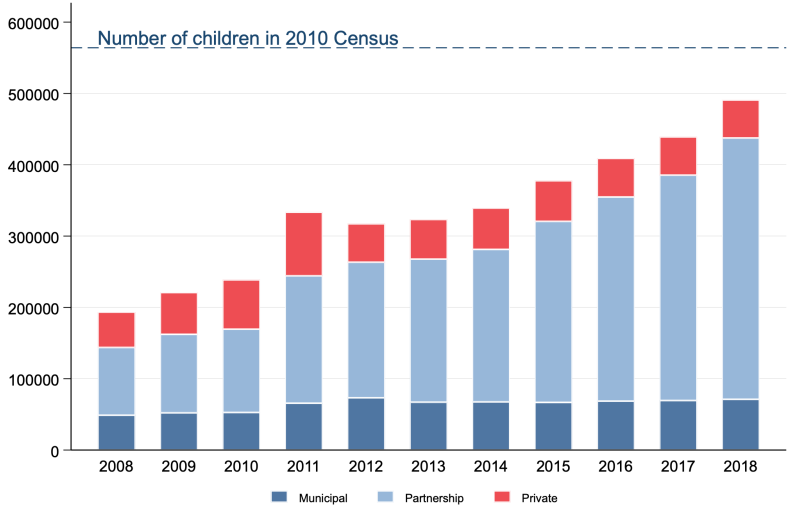
Expansion of Childcare



Setting: Enrollment with More Data



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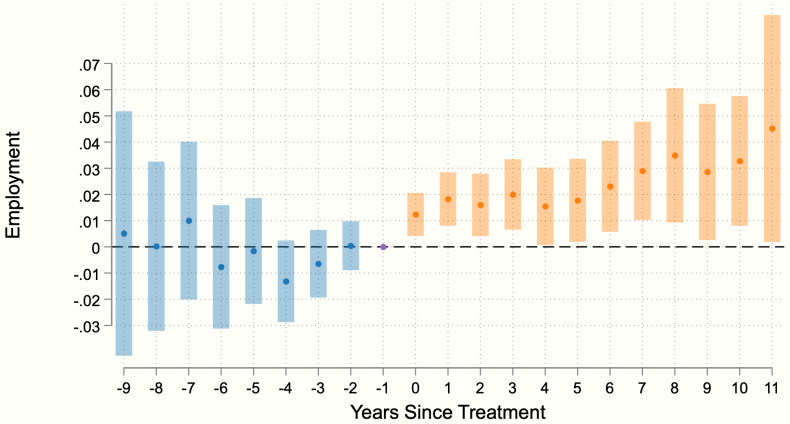
Mothers' Employment - Full Extent



Pre average: -0.002
Post average: 0.024***
Pretrends p-value: 0.343
Pre = Post p-value: 0.070

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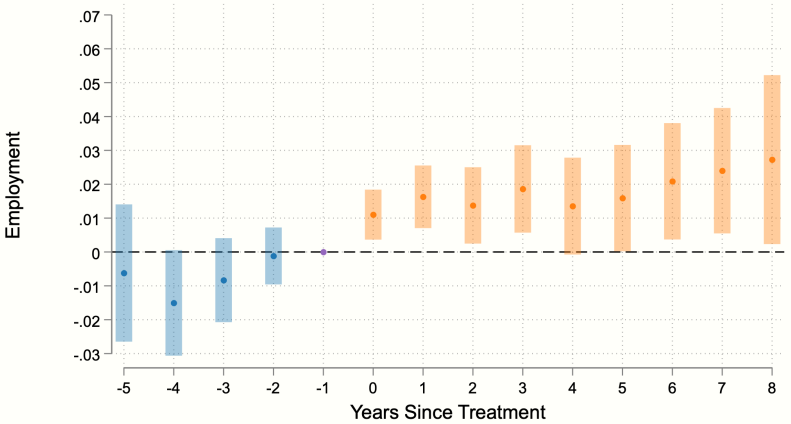
Mothers' Employment - Alternative Definition (Median)



Pre average: -0.008
Post average: 0.018***
Pretrends p-value: 0.297
Pre = Post p-value: 0.011

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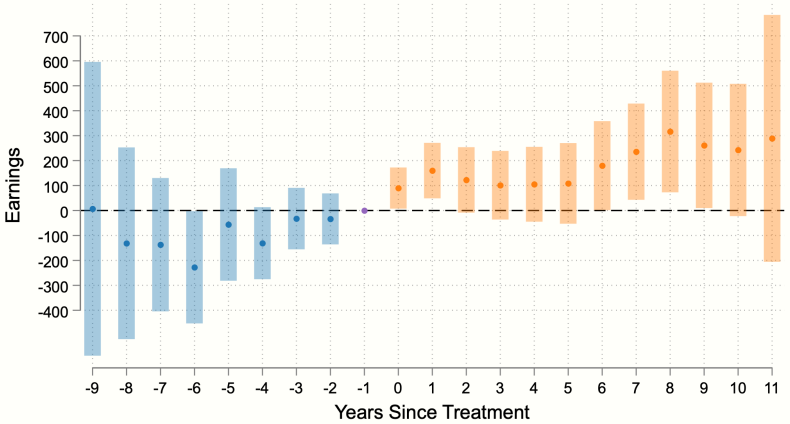
Mothers' Earnings - Full Extent



Pre average: -92.7
Post average: 184.4**
Pretrends p-value: 0.282
Pre = Post p-value: 0.070

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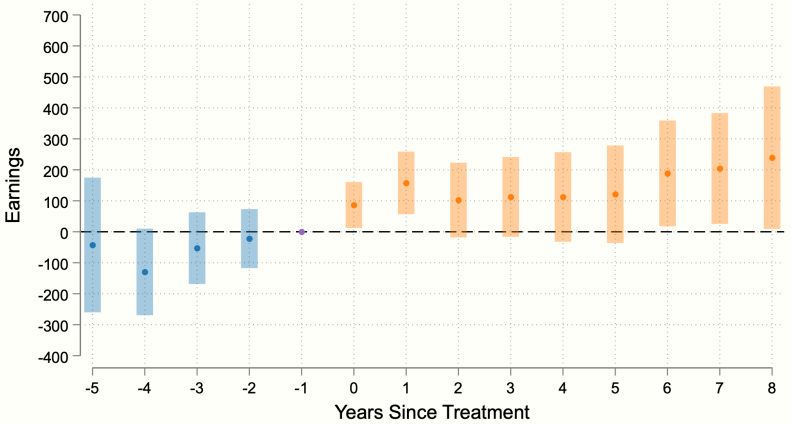
Mothers' Earnings - Alternative Definition (Median)



Pre average: -61.8
Post average: 147.2**
Pretrends p-value: 0.262
Pre = Post p-value: 0.033

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