Do Family Policies Reduce Gender Inequality?
Evidence from 60 Years of Policy Experimentation

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Gender Inequality and Family Policies

- ▶ Dramatic expansions of family policies over the last 60 years

  - ▶ Maternity and parental leave policies

  - ▶ Child care provision and subsidization

- ▶ Impact of these policies on gender gaps is still debated

  - ▶ Widespread belief that family policies could be helpful

  - ▶ But also a concern that some policies may have backfired

- ▶ We ask: what would gender gaps be today absent this massive expansion of family policies?

Family Policies and Child Penalties

▶ Most of the literature estimates the contemporaneous impact of policy on female labor supply or earnings

▶ We study effects on "child penalties"

    ▶ Capture full dynamic impacts on careers of women vs men

    ▶ Pionieering studies: Capture full dynamic impacts on careers of women vs men

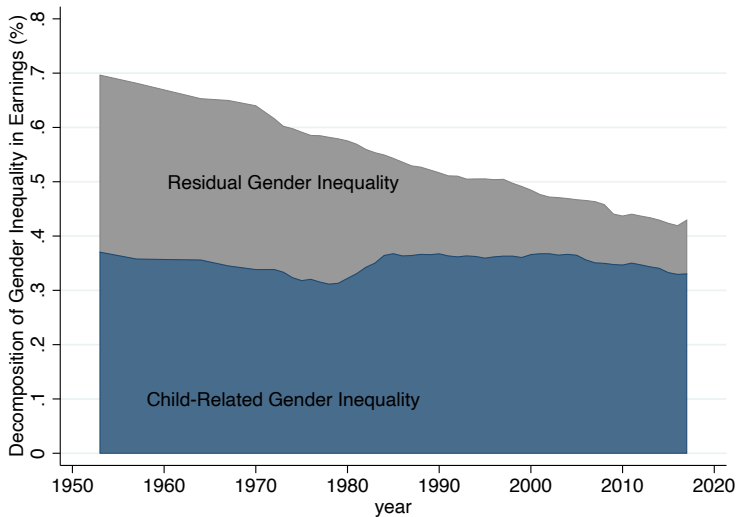▶ Enables us to map estimates back into cross-sectional gender inequality decomposition

The Parental Leave / Child Care Provision Bundle

► Most of the literature focuses on one specific policy reform in isolation

  ► Misses potential non-linearities and equilibrium effects.

  ► We study **all reforms over last 50 years**, and pay attention to non-linearities, spillovers and equilibrium effects

► Most of the literature focuses on one family policy in isolation

  ► But parental leave and child care are bundle of policies

  ► There may be complementarities/cross effects btw the two

 ► We study **both policies and their potential interaction** within a single empirical setting

Rich Policy Variation

▶ Unique admin data on labor market and birth histories of Austrian workers from **1953 to 2017**

▶ Combined with rich policy variation in Austria:
  ▶ Multiple parental leave reforms at different baseline levels (RD)
  ▶ Country-wide roll out of heavily subsidized child care expansions (DiD a la Duflo 2001)

▶ **Family policy has had no impact on gender convergence**
  ▶ **Parental leave:** Negative short-run effect; no long-run effect (Marginal treatment effect is declining in baseline level)
  ▶ **Child care:** Very small effect, if any
  ▶ **Interaction:** None

Gender Gap in Earnings 1955-2017

Counterfactual Gender Gap With No Policy Reforms
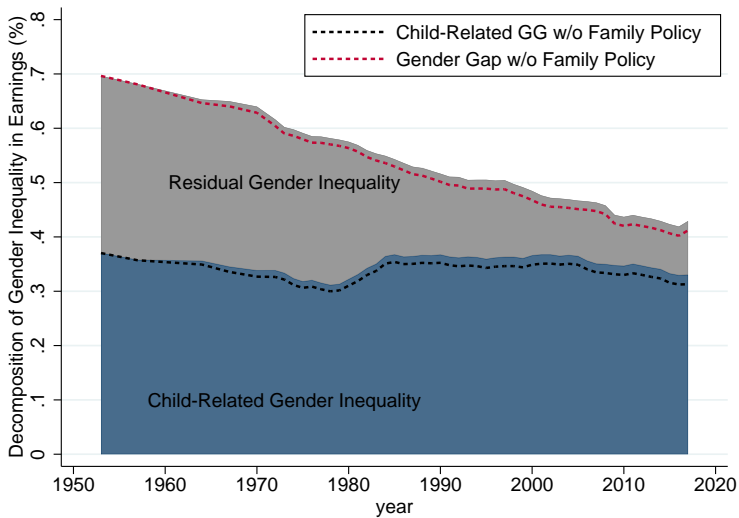
Context and Data

The Austrian Context

- A gender conservative environment:
  - Total gender gap in earnings: ≈40% `Gender Gaps`
  - Relatively low female LFP
  - Prevalence of conservative gender norms `Elicited Values`

- Generous maternity leave policy:
  - Up to 30 months, with replacement rate ≈40% net median female earnings
  - Multiple reforms of parental leave over last 50 years
    - 1961, 1990, 1996, 2000, 2008

- Institutional child care provision before age 5:
  - **Nurseries (age 1-2)**: limited provision ≈15% of children
  - **Kindergarten (age 3-5)**: more widespread ≈75% of children
  - Heavily subsidized

Data

- **ASSD**: Universe of matched employer employee data 1972-2017
  - Info on annual earnings + labor contract start/end dates
  - Detailed geographical info on place residence
  - + **REV**: earnings history from pension data since 1953
- Linking children to parents:
  - ASSD+REV: information on child births for women
  - Tax data: link fathers to mothers and child
- **Detailed municipality level data on child care provision**
  - For all child care institutions (nurseries and kindergarten), info on number of teachers and legal max # of children per teacher

Child Penalties

Child Penalty in Earnings
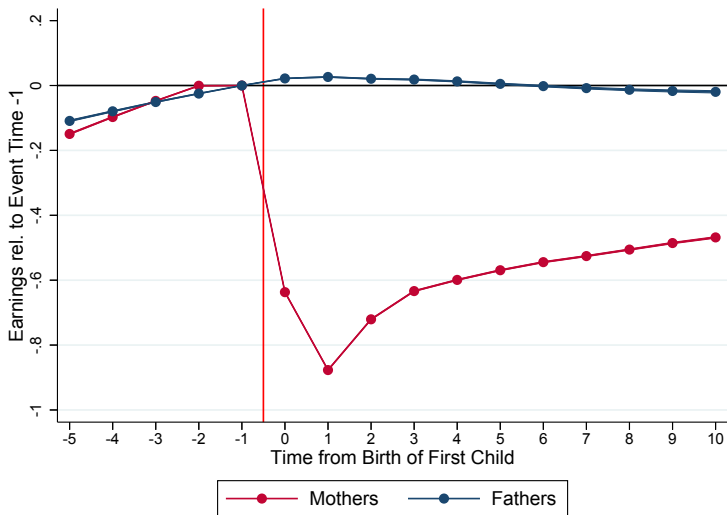
Child Penalty in Extensive Margin Labor Supply
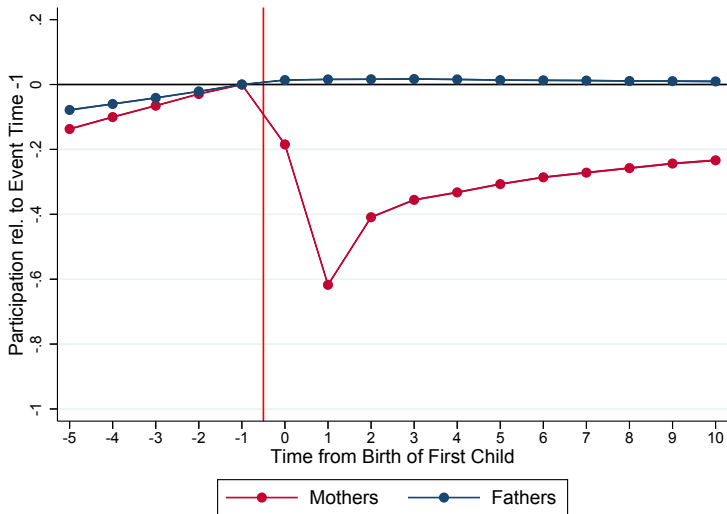
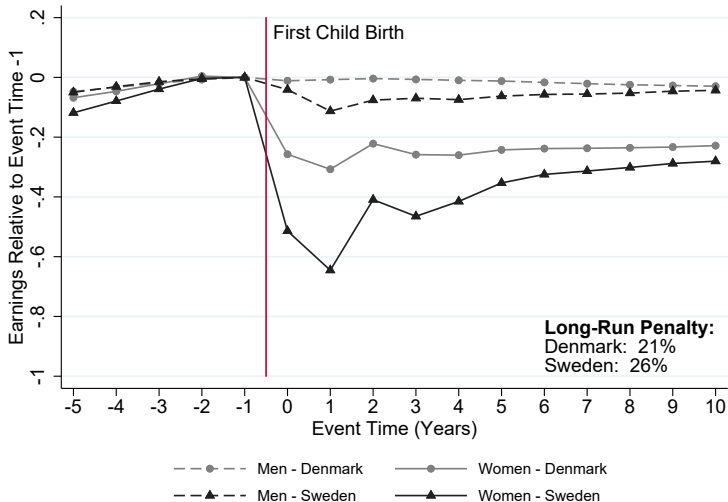# Child Penalty in Intensive Margin Labor Supply
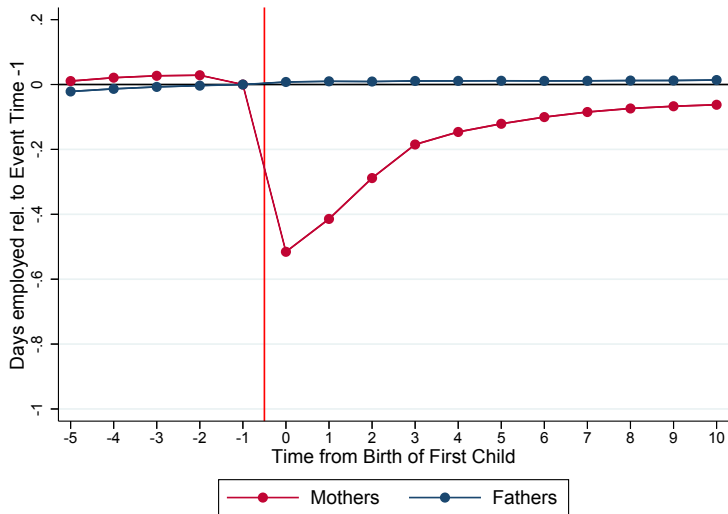
Child Penalty in Daily Wage Rate
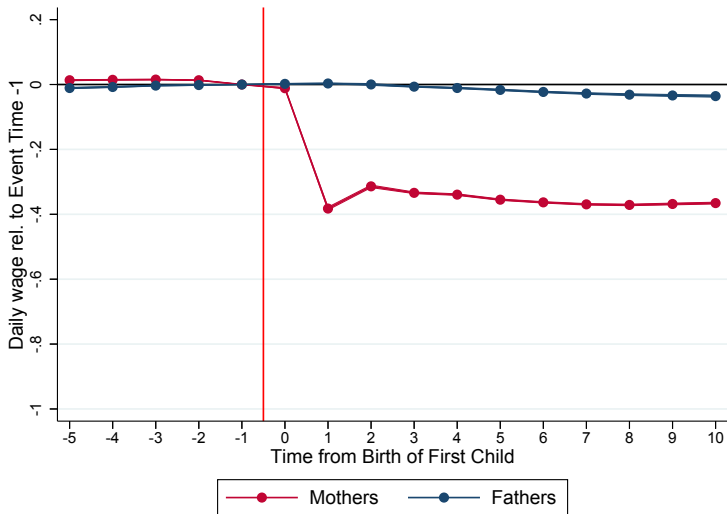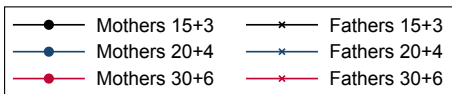
Child Penalty: German-Speaking Countries
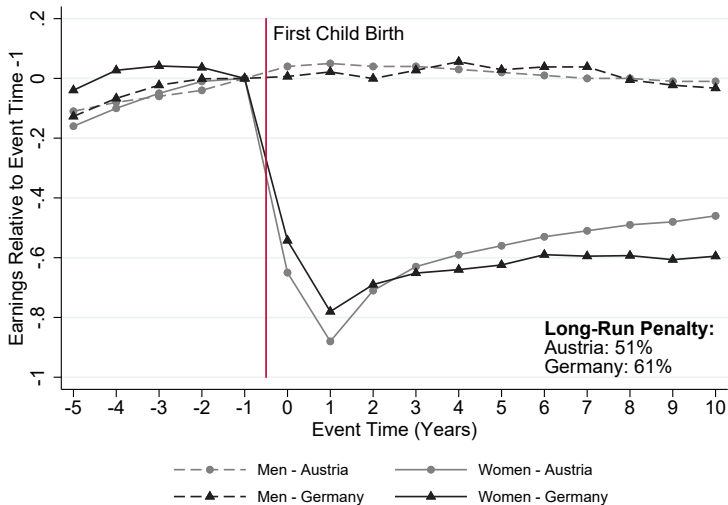
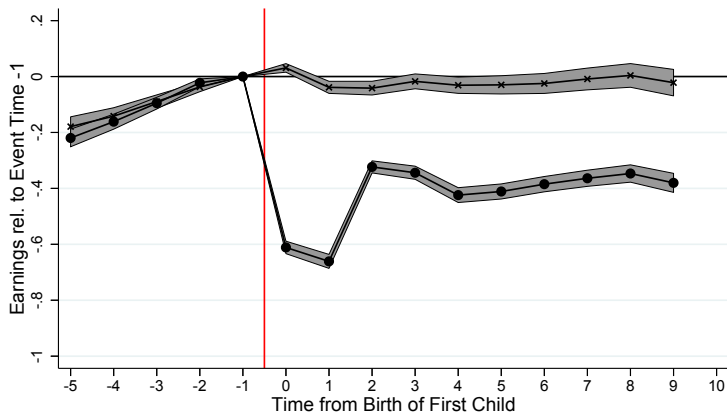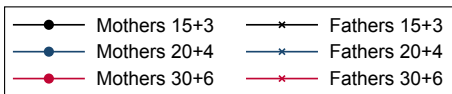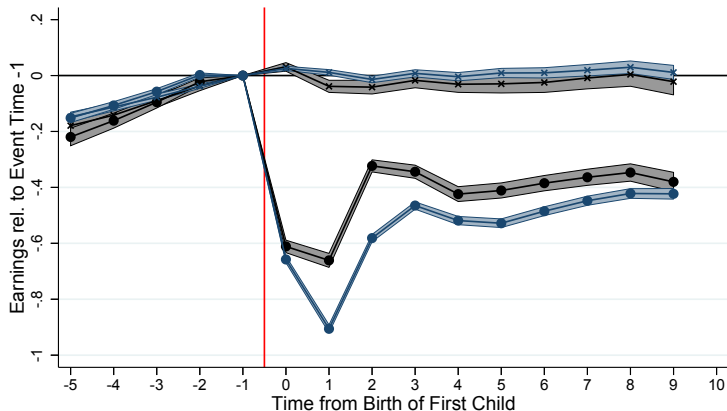# Child Penalty: Scandinavian Countries

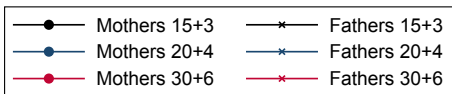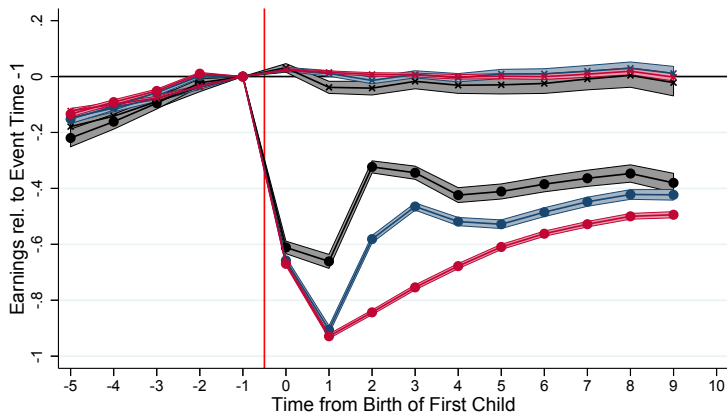# Impact of Parental Leave Policy

2008 Regime: Child Penalty by Parental Leave Option

# 2008 Regime: Child Penalty by Parental Leave Option

2008 Regime: Child Penalty by Parental Leave Option

Parental Leave Reforms: Empirical Strategy

- ▶ 2008 regime evidence confounded by selection into parental leave option
- ▶ Use 4 reforms that exogenously changed PL duration:
  - ▶ **1961**: introduction of 12 months PL
  - ▶ **1990**: increase duration from 12 to 24 months
  - ▶ **1996**: decrease duration from 24 to 18 months
  - ▶ **2000:** increase duration from 18 to 30 months
- ▶ Job protection increased from 12 to 24 months in 1990
- ▶ 1990 to 2000 reforms:
  - ▶ Replacement rate was kept constant
  - ▶ Regime eligibility depends on DOB of child (no grandfathering)
  - ▶ **RD based on DOB of 1st child** relative to cutoff date

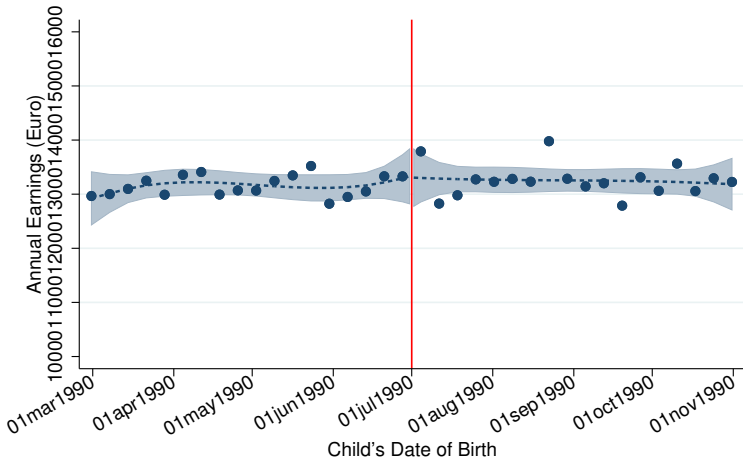# 1990 Reform: 3 Years Before Birth
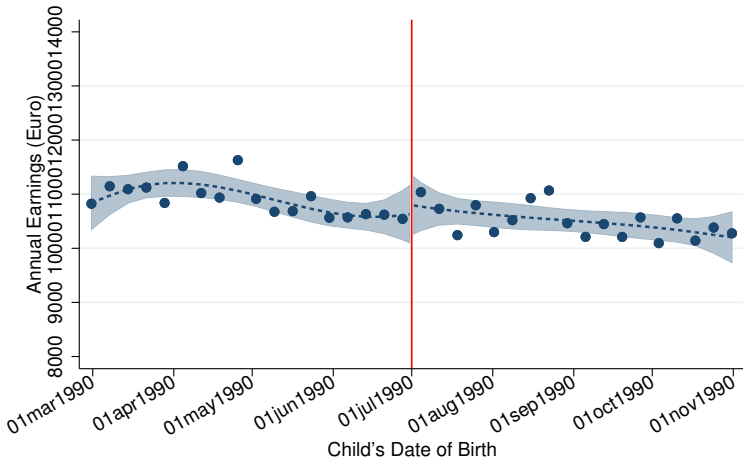
RD Estimate: 151.3 (393.7)
Div. by Counterfactual: 0.0131 (0.0340)
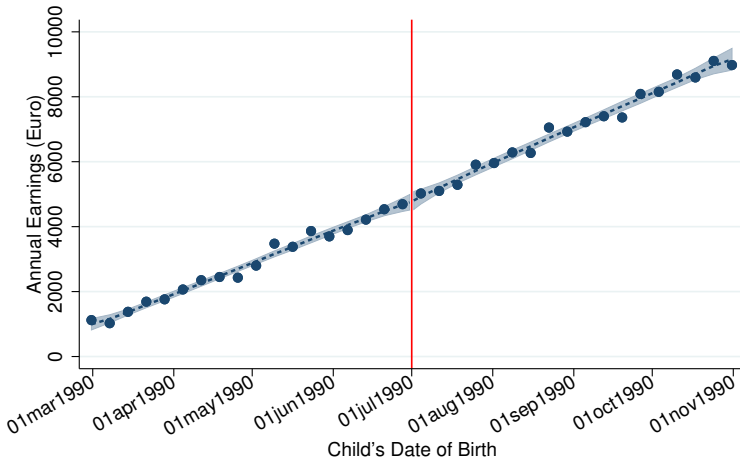
1990 Reform: 2 Years Before Birth
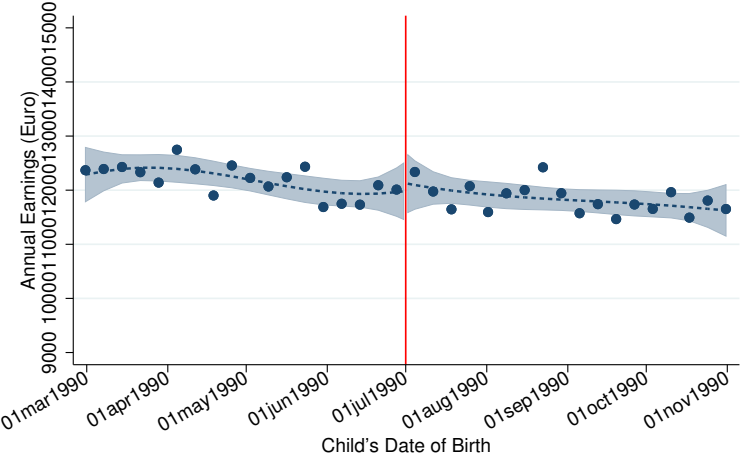
RD Estimate: 133.3 (392.5)
Div. by Counterfactual: 0.0107 (0.0314)
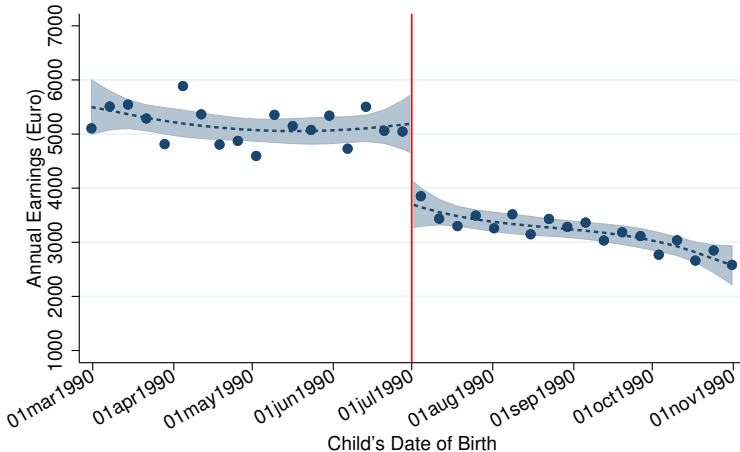
1990 Reform: 1 Year Before Birth

RD Estimate: −38.3 (386.0)
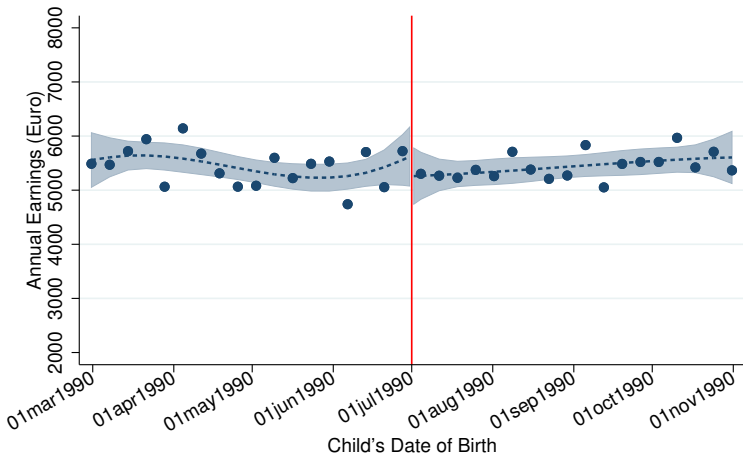Div. by Counterfactual: −0.0029 (0.0290)

1990 Reform: Year of Birth

RD Estimate: 27.6 (191.3)
Div. by Counterfactual: 0.0020 (0.0137)

1990 Reform: 1 Year After Birth

RD Estimate: −1522.5 (236.1)
Div. by Counterfactual: −0.1059 (0.0164)

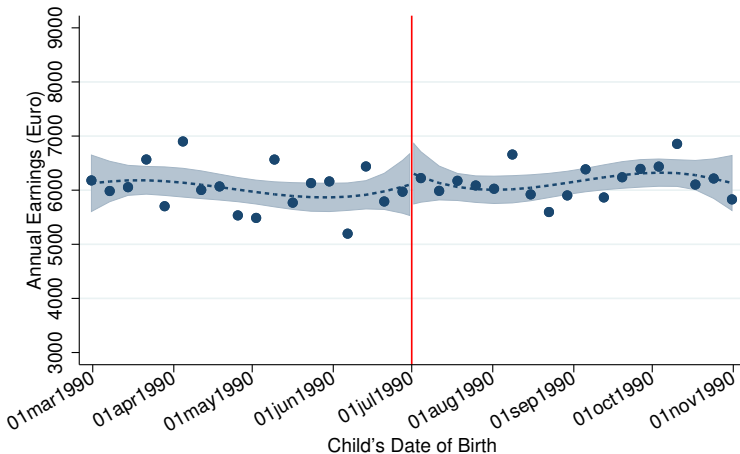# 1990 Reform: 2 Years After Birth

RD Estimate: –1501.6 (356.4)
Div. by Counterfactual: –0.1021 (0.0242)

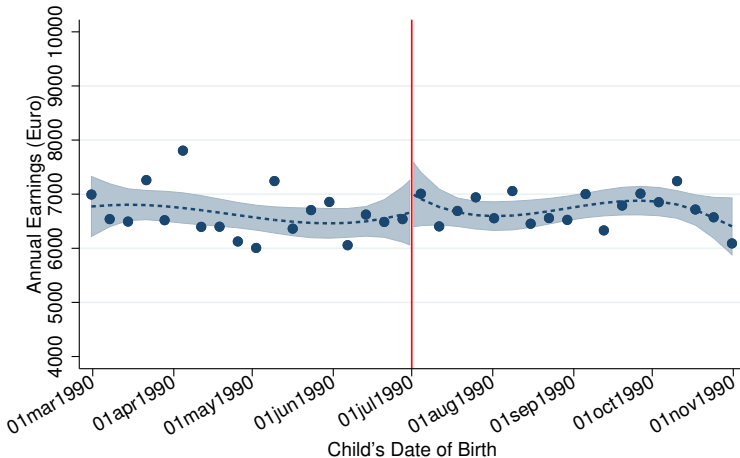# 1990 Reform: 3 Years After Birth

RD Estimate: −387.2 (396.9)
Div. by Counterfactual: −0.0259 (0.0265)
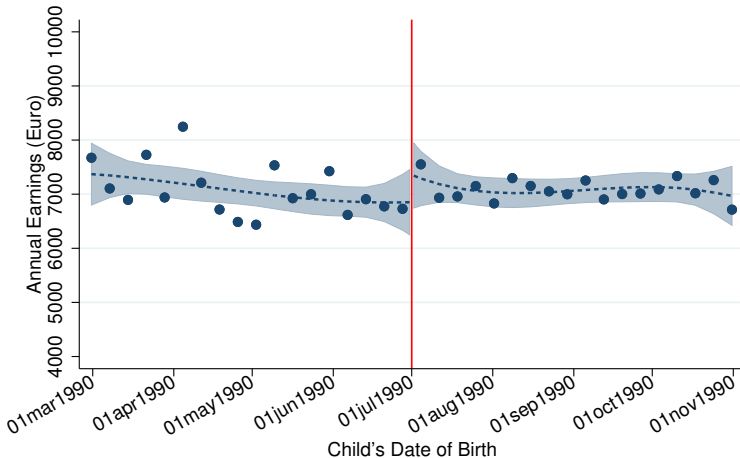
1990 Reform: 4 Years After Birth

RD Estimate: 184.5 (419.9)
Div. by Counterfactual: 0.0122 (0.0277)

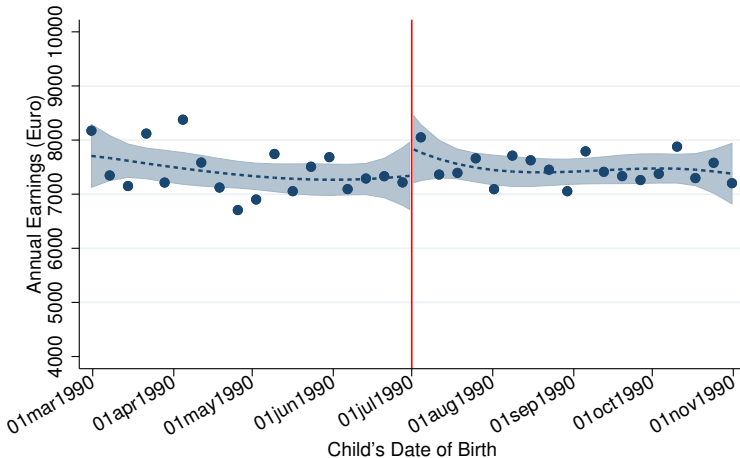# 1990 Reform: 5 Years After Birth

RD Estimate: 316.7 (440.6)
Div. by Counterfactual: 0.0206 (0.0286)

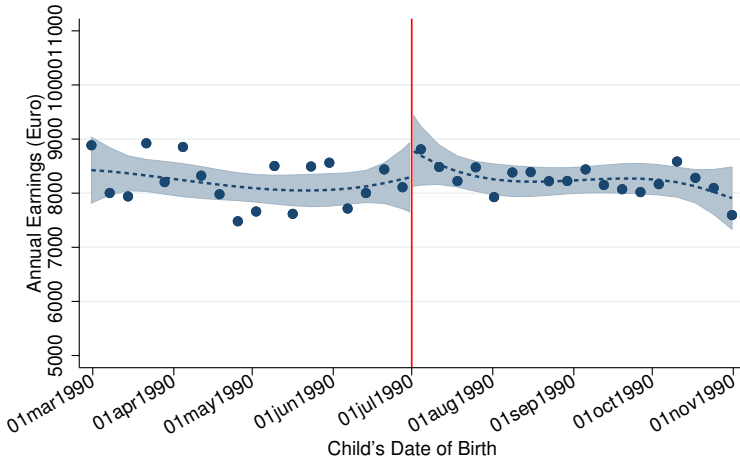# 1990 Reform: 6 Years After Birth

RD Estimate: 488.7 (447.3)
Div. by Counterfactual: 0.0311 (0.0284)

1990 Reform: 7 Years After Birth
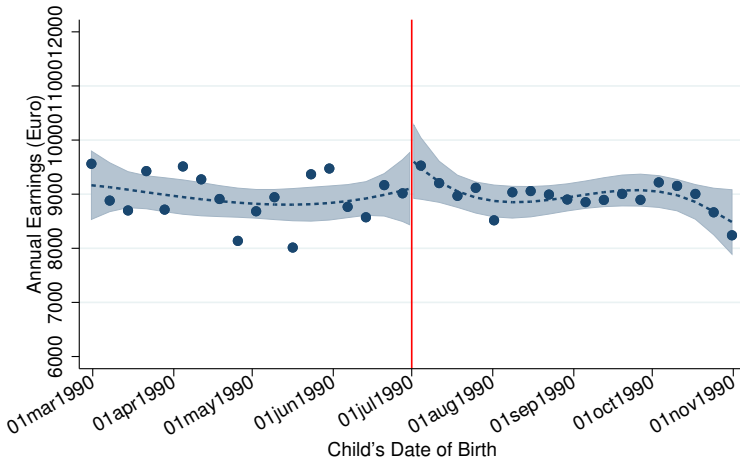

RD Estimate: 483.5 (460.7)
Div. by Counterfactual: 0.0302 (0.0288)

1990 Reform: 8 Years After Birth

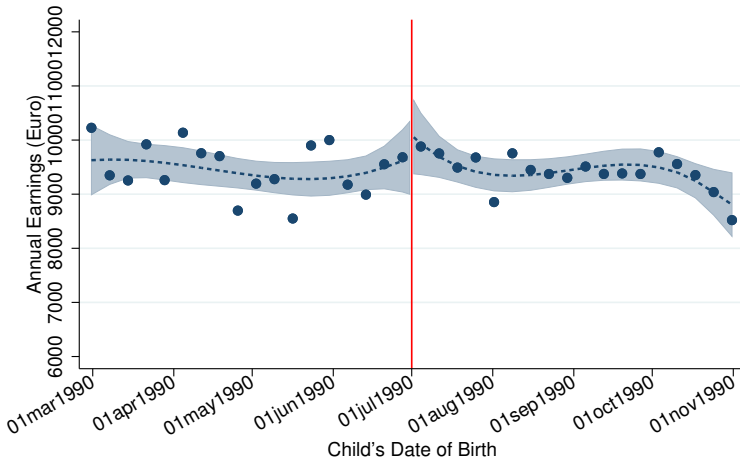RD Estimate: 471.5 (478.9)
Div. by Counterfactual: 0.0288 (0.0292)

1990 Reform: 9 Years After Birth

RD Estimate: 485.4 (500.2)
Div. by Counterfactual: 0.0288 (0.0297)

1990 Reform: 10 Years After Birth

RD Estimate: 360.1 (502.1)
Div. by Counterfactual: 0.0208 (0.0290)

1990 Reform: Dynamic RD Estimates
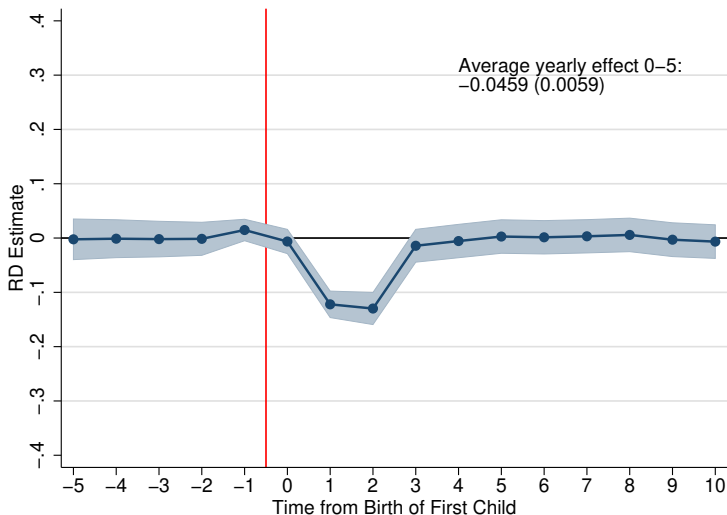
Average yearly effect 0–5:
−0.0459 (0.0059)

RD Estimate

Time from Birth of First Child

1990 Reform: Effects on Child Penalties

Average yearly effect 0–5:
−0.0459 (0.0059)

Plot axes: Earnings rel. to Event Time −1 (y-axis) vs Time from Birth of First Child (x-axis). Legend: Baseline — Adding Parental Leave Effect

1996 Reform: Dynamic RD Estimates

Average yearly effect 0–5:
0.0359 (0.0103)
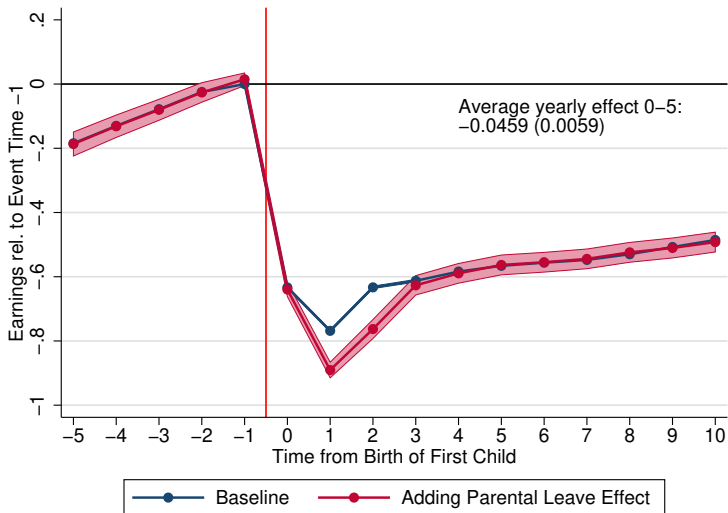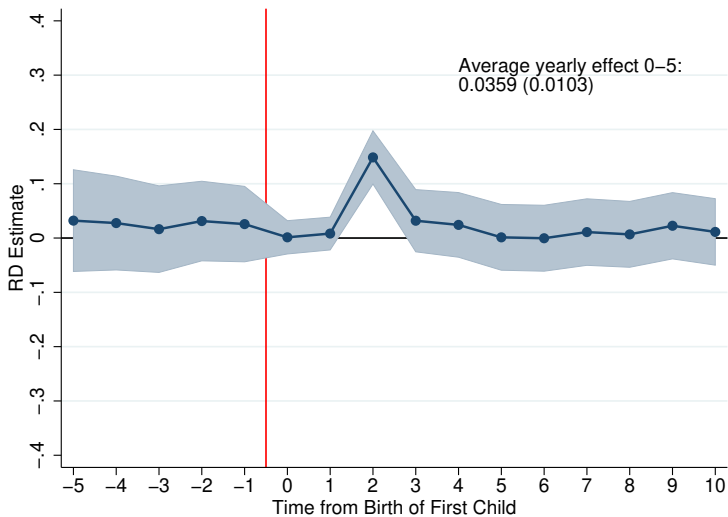
1996 Reform: Effects on Child Penalties

2000 Reform: Dynamic RD Estimates

Average yearly effect 0–5:
–0.0296 (0.0110)

Y-axis: RD Estimate

X-axis: Time from Birth of First Child

2000 Reform: Effects on Child Penalties

Average yearly effect 0–5:
−0.0172 (0.0067)

X-axis: Time from Birth of First Child
Y-axis: Earnings rel. to Event Time −1

Legend: Baseline — Adding Parental Leave Effect
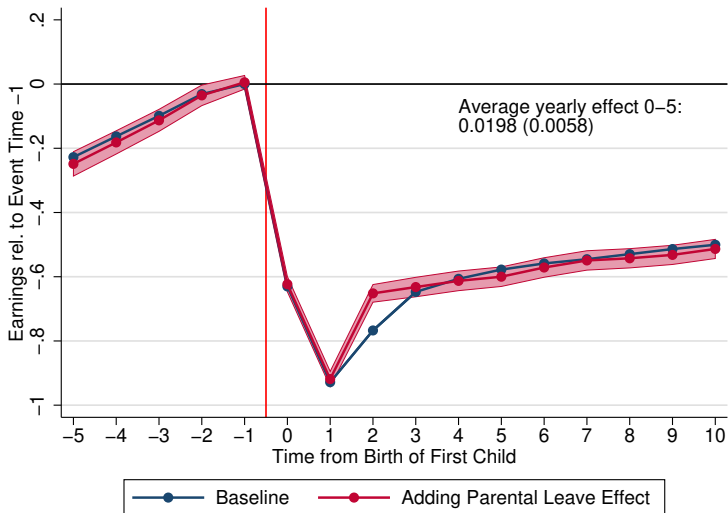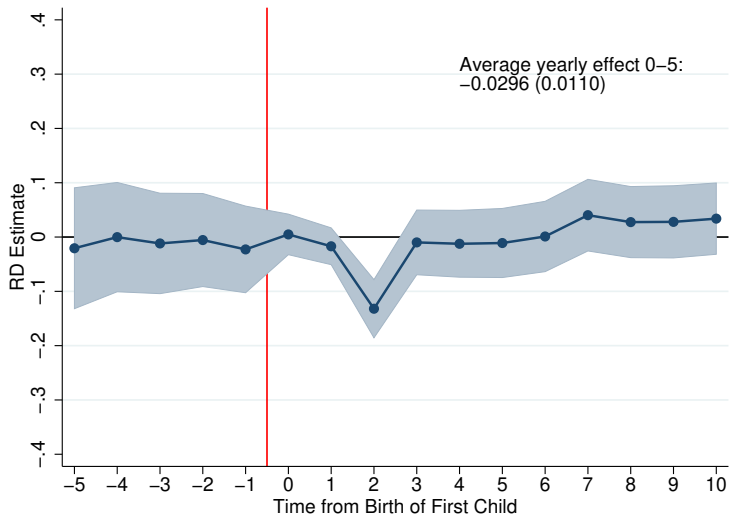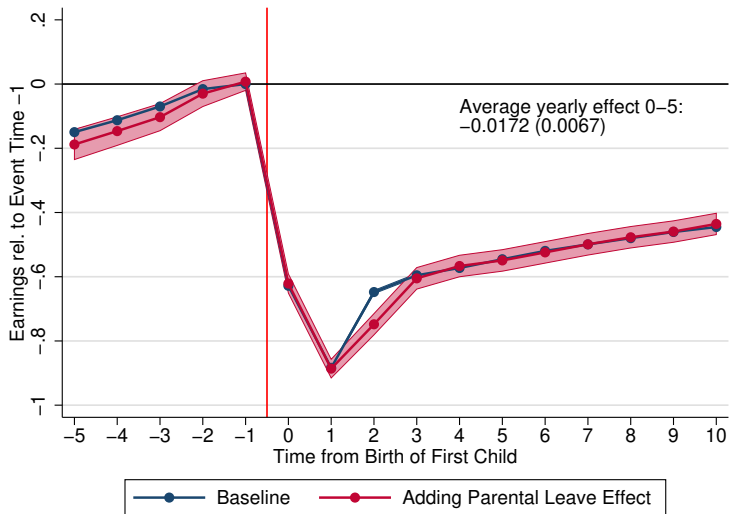
Parental Leave: The 1961 Reform

- ▶ Introduction of 1 year Parental Leave
  - ▶ Starting in January 1961
  - ▶ PL comes with 1 year Job Protection `1961 Reform Details`
  - ▶ Interesting in context of US debate

- ▶ Data:
  - ▶ REV: Pension system register with info on careers since 1949
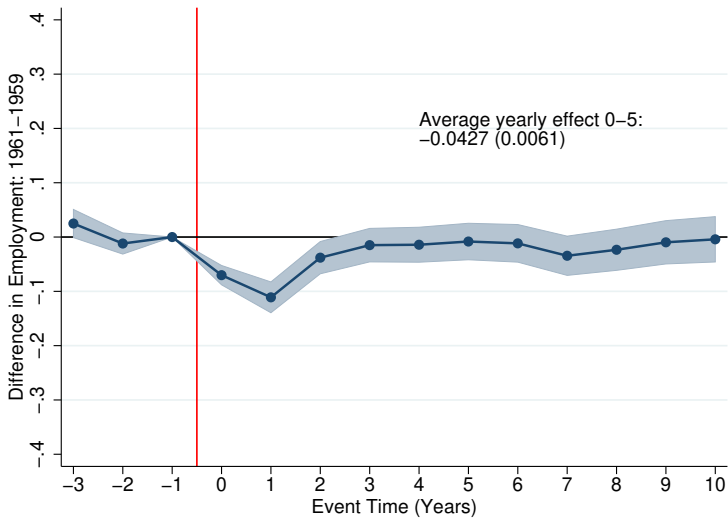
- ▶ Strategy: Diff-in-Diff
  - ▶ Grandfathering (no RD) `1961 Reform Take-Up`
  - ▶ Compare 1959 births to 1961 births
  - ▶ Identification: no trends in child penalties by birth-cohort

1961 Reform: Dynamic Employment Effects

Average yearly effect 0–5:
–0.0427 (0.0061)
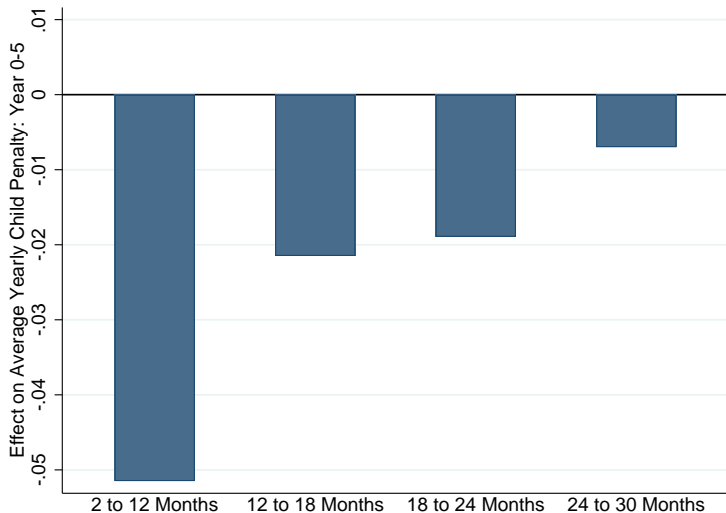
1961 Reform: Dynamic Earnings Effects

Average yearly effect 0–5:
−0.0513 (0.0088)
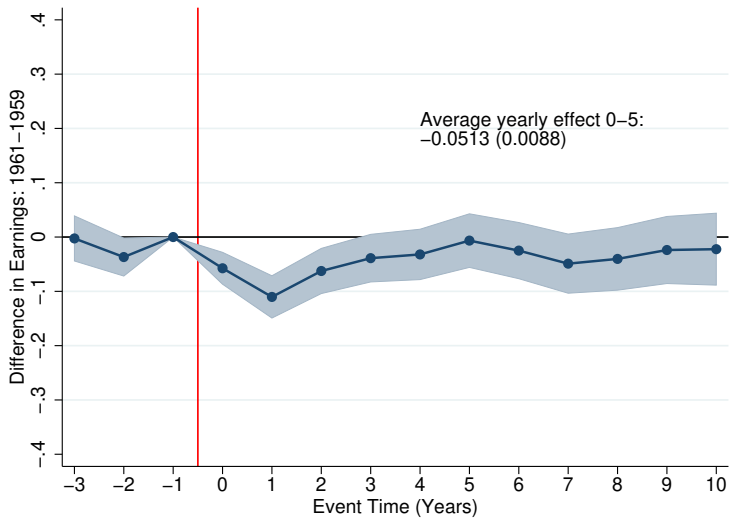
Parental Leave Expansions: Effects by Duration

Impact of Child Care Provision

Granular Measures of Child Care Provision

- ▶ For each municipality X year, granular information on all nurseries & kindergarten:
  - ▶ Location, opening hours, # of teachers, contracts (part-time/full time), and legal max # of children per teacher

- ▶ Create 2 indices of child care provision at municipality level:
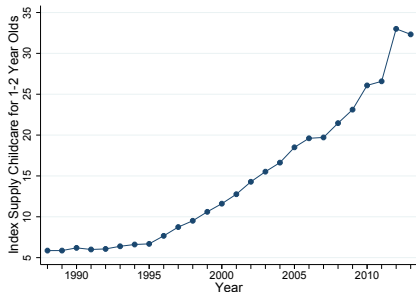 - ▶ **Index 1-2 (Nursery Care)**

    $$\text{Index 1-2} = \frac{\text{\# FTE Child Care Spots for Children Age 1-2}}{\text{\# Children of Age 1-2}}$$

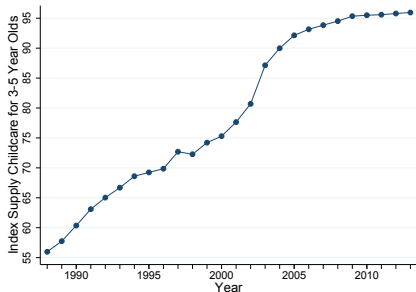 - ▶ **Index 3-5 (Pre-School Care)**

    $$\text{Index 3-5} = \frac{\text{\# FTE Child Care Spots for Children Age 3-5}}{\text{\# Children of Age 3-5}}$$

Index of Child Care Provision Over Time

Child Care Index 1-2

Child Care Index 3-5

Spatial Variation in Child Care Provision

Index 1-5 - 1990

Legend:
- (60,100]
- (45,60]
- (30,45]
- (15,30]
- [0,15]
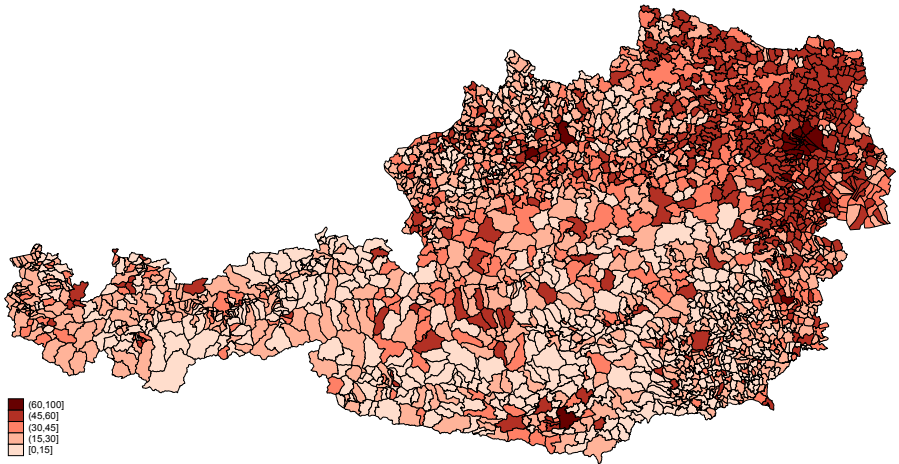
Child Penalty by Level of Child Care Provision

Below vs Above Median Index 1-5 in 1990

Average yearly effect 0–5
ITT=0.0511 (0.0007)
TOT=0.1583 (0.0023)
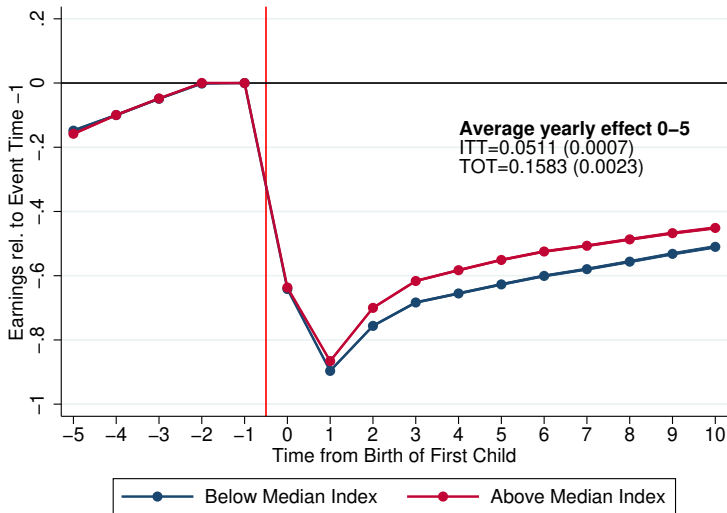
Spatial Variation in Child Care Expansion

Change in Index 1-5 Between 1990 and 2000

Legend:
- (35,100]
- (20,35]
- (10,20]
- (0,10]
- [-60,0]
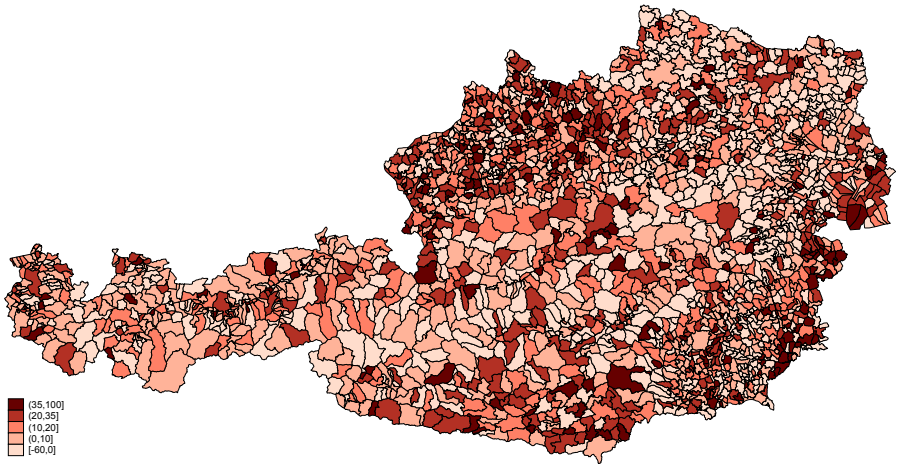
Spatial Variation in Child Care Expansion

Change in Index 1-5 Between 2000 and 2010

Legend:
- (35,100]
- (20,35]
- (10,20]
- (0,10]
- [-60,0]
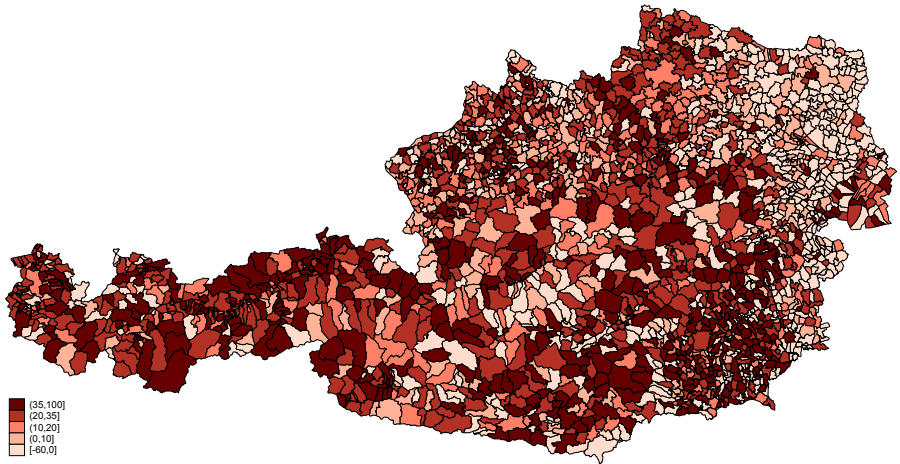
Exploiting Local Child Care Expansions

- ▶ Spatial variation is conceptually appealing
  - ▶ Macro vs micro effect
  - ▶ No comparison btw women with vs w/o young children (biased by dynamic effects)
  - ▶ But spatial variation often endogenous

- ▶ Isolate episodes of large and sudden increases in child care provision at municipality level
  - ▶ Index increase > 20 in a single year
  - ▶ Driven by large supply shocks (new facility, new teachers)

- ▶ Compare dynamic outcomes of women in treated municipalities to similar women (IPW) in control municipalities

- ▶ Compare expansions of nursery care (year 1-2) vs pre-school care (year 3-5)

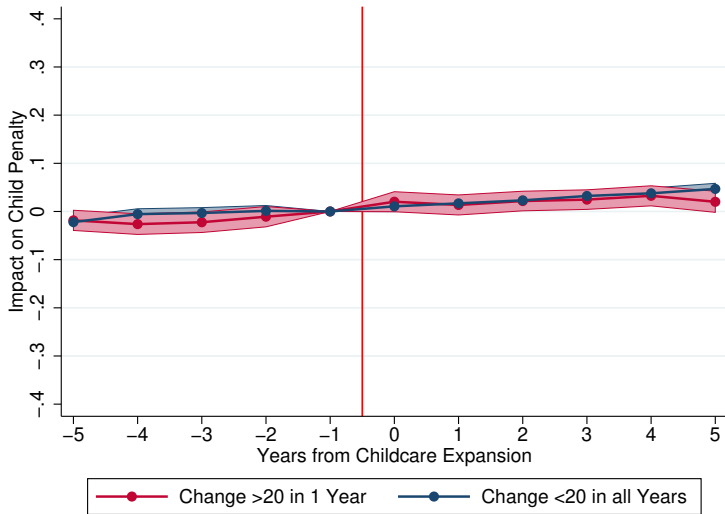# Nursery Care Expansion (Year 1-2)

Actual Take Up
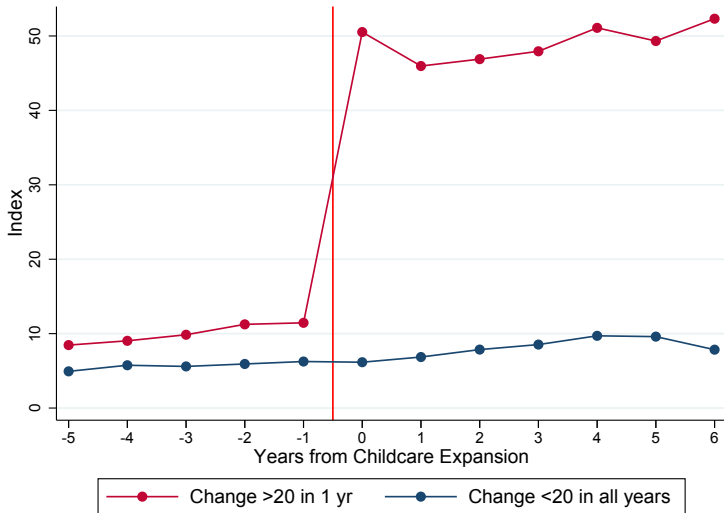
Pre-School Care Expansion (Year 3-5)
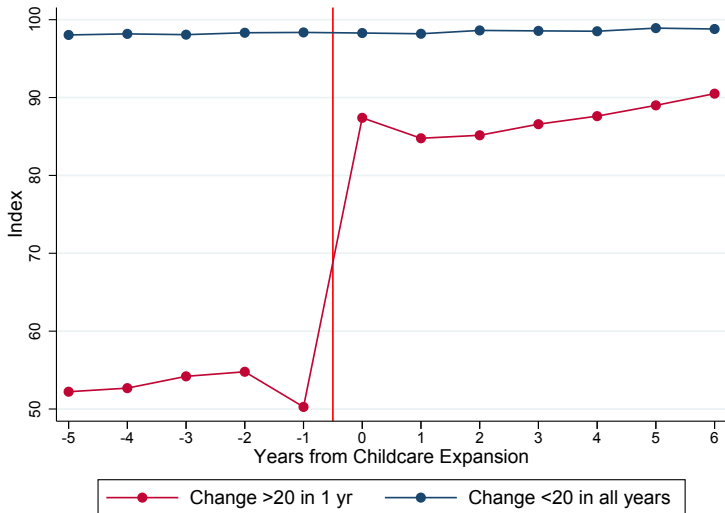
Nursery Care Expansion

Earnings 1 Year Before Birth

Nursery Care Expansion
Earnings in Year 1 & 2 Post Birth
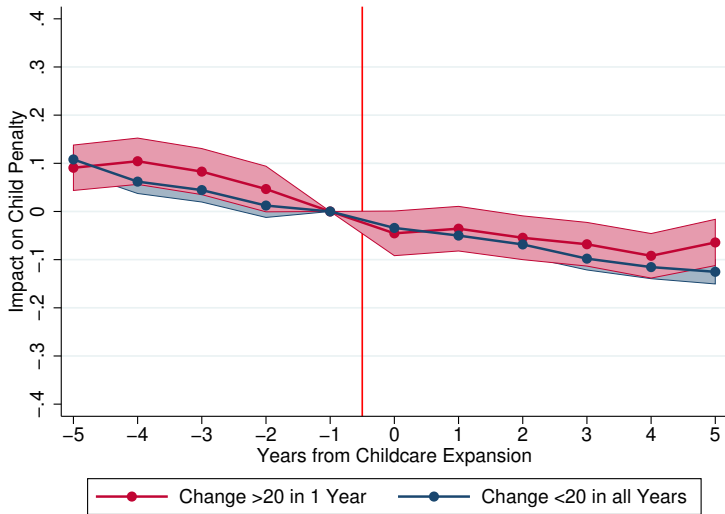
Impact on Child Penalty (y-axis, from −.4 to .4)

Years from Childcare Expansion (x-axis, from −5 to 5)

Legend: Change >20 in 1 Year — Change <20 in all Years

Nursery Care Expansion
Earnings in Year 1 & 2 Post Birth

ITT:
Change in earnings penalty
0.022 (0.027)

Impact on Child Penalty

Years from Childcare Expansion

— Change >20 in 1 Year   — Change <20 in all Years

Nursery Care Expansion

Earnings in Year 1 & 2 Post Birth

TOT:
Impact of moving childcare
coverage from 0 to 100%
0.060 (0.074)

Legend: Change >20 in 1 Year — Change <20 in all Years
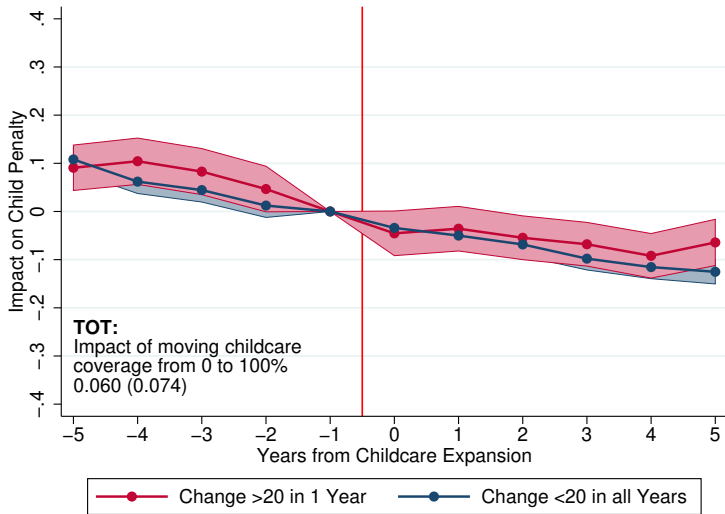
Nursery Care Expansion

Effect on Child Penalty 10 Years After Reform
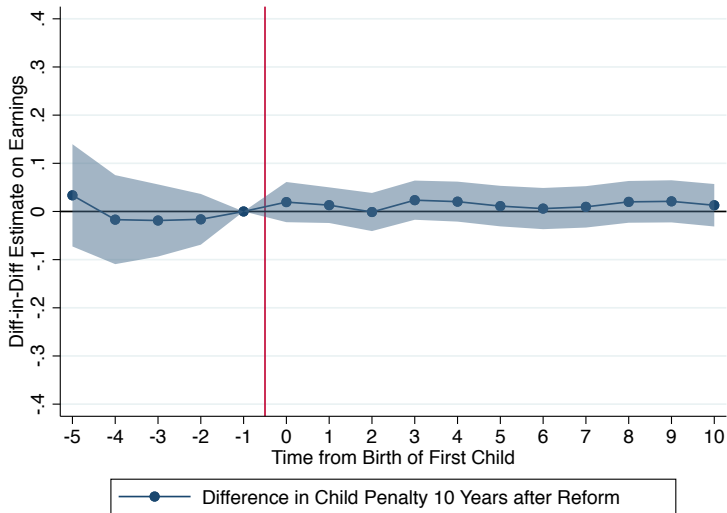
Difference in Child Penalty 10 Years after Reform

Pre-School Care Expansion

Earnings 1 Year Before Birth

Figure axis labels: Impact on Child Penalty (y-axis), Years from Childcare Expansion (x-axis). Legend: Change >20 in 1 Year; Change <20 in all Years.
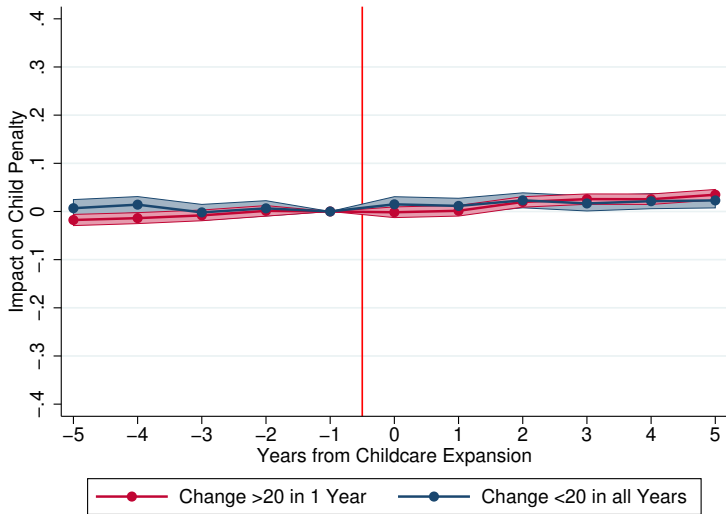
Pre-School Care Expansion

Earnings 3 to 5 Years Post Birth

TOT:
Impact of moving childcare
coverage from 0 to 100%
−0.037 (0.097)

Legend: Change >20 in 1 Year · Change <20 in all Years

Y-axis: Impact on Child Penalty
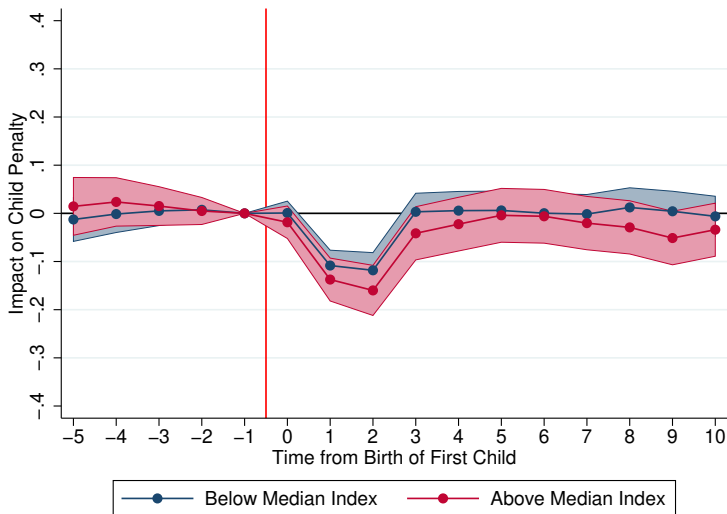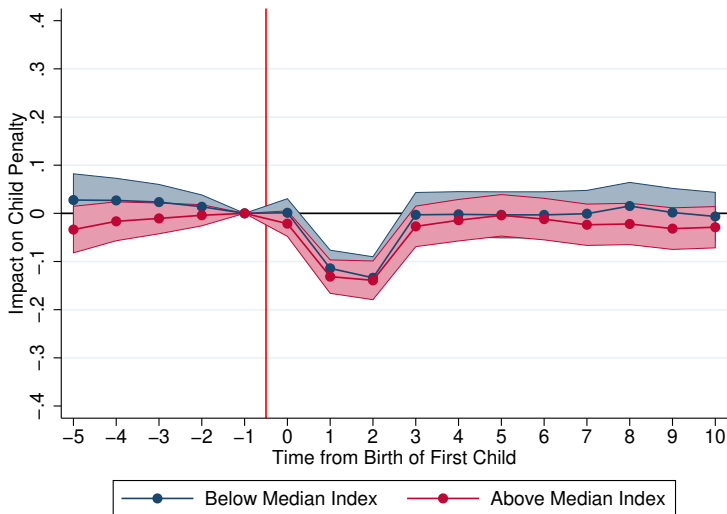X-axis: Years from Childcare Expansion
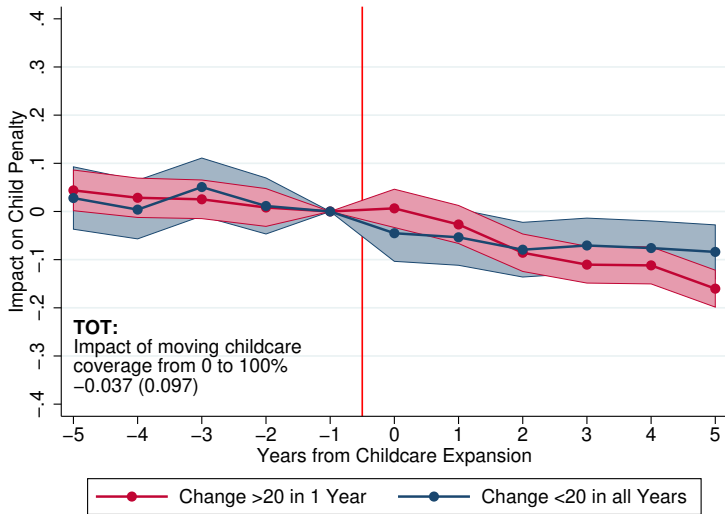
Interaction Effects?

Effects of 1990 Parental Leave Reform by Level of Child Care Provision (Index 1-5)
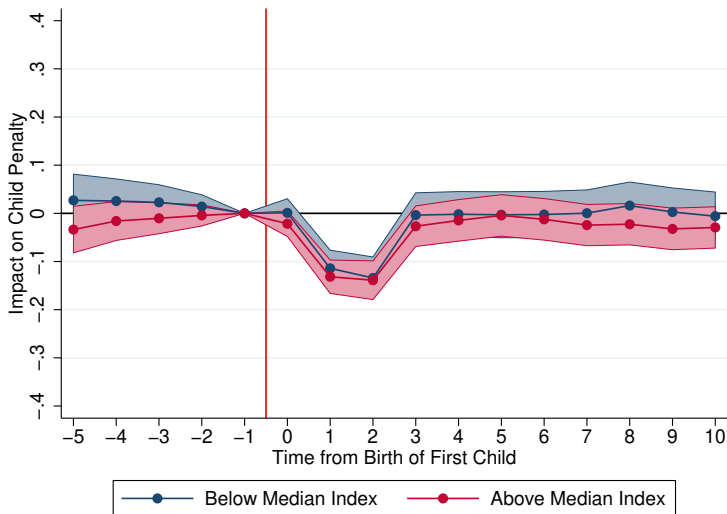
Effects of 1990 Parental Leave Reform by Level of Child Care Provision (Index 1-2)

Effects of 1990 Parental Leave Reform by Level of Child Care Provision (Index 3-5)
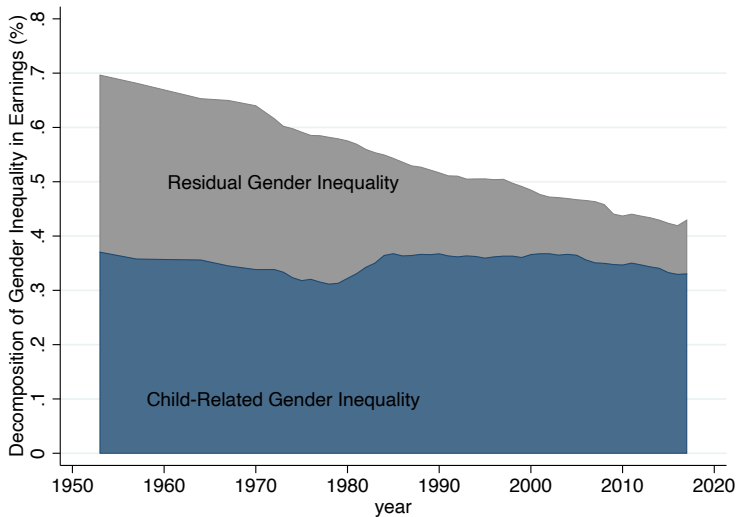
Implications For Gender Inequality

Gender Inequality: What Have Family Policies Done?

- ▶ OB decomposition of long run cross-sectional GG in earnings
    - ▶ Use measures of child penalties over long run
    - ▶ Decompose GG btw child-related inequality vs other factors

- ▶ Create counterfactual measures of GG in earnings
    - ▶ Use our estimates of effects of policy reforms on child penalties
    - ▶ Simulate GG for alternative policy scenarii over last 50 years
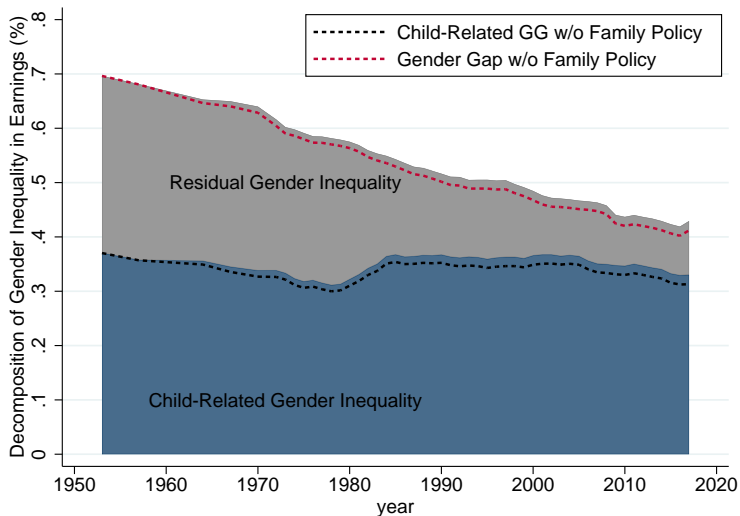
Methodology

- ▶ Long term decline in gender inequality
    - ▶ But mostly due to other factors (education, etc.)
    - ▶ Stable child-related inequality, explains growing share of GG
    - ▶ **Very limited role of policies on long term gender inequality**

Gender Gap in Earnings 1955-2017

Chart title (y-axis): Decomposition of Gender Inequality in Earnings (%)
Labeled regions: Residual Gender Inequality; Child-Related Gender Inequality
x-axis: year

Counterfactual Gender Gap With No Policy Reforms

Counterfactual Gender Gap With Fertility Effects

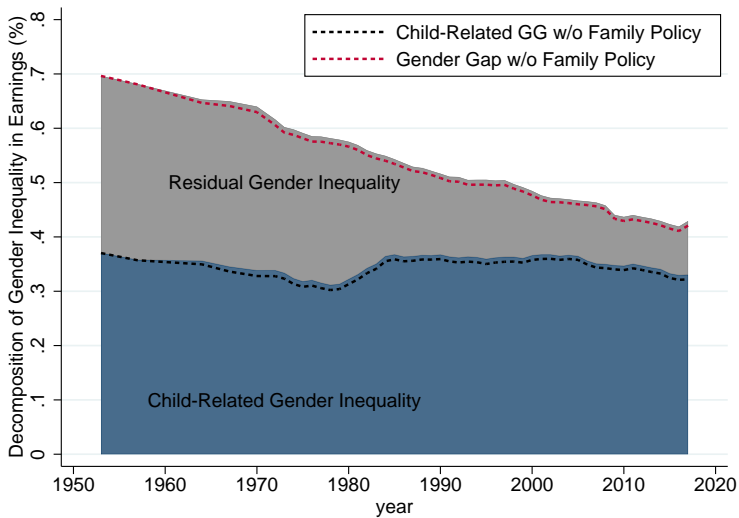Table: Sensitivity Of Counterfactual Gender Gap Estimates

Year	1953	1964	1970	1980	1990	2000	2010
No Parental Leave and No Child Care (Baseline)							
Earnings Gap	0.696	0.646	0.628	0.562	0.499	0.463	0.414
Child-Related Gender Gap	0.370	0.349	0.326	0.309	0.349	0.344	0.324
No Parental Leave and No Child Care (Optimistic)							
Actual Earnings Gap	0.696	0.648	0.632	0.565	0.503	0.474	0.428
Child-Related Gender Gaps	0.370	0.351	0.330	0.312	0.353	0.355	0.338
No Parental Leave and No Child Care (Pessimistic)							
Earnings Gap	0.696	0.644	0.624	0.559	0.495	0.452	0.400
Child-Related Gender Gap	0.370	0.346	0.322	0.306	0.345	0.333	0.309

Why Aren't Policies More Effective?

- ▶ Take-up of institutional child care not conducive to higher labor supply. Why?
    - ▶ Crowd-out of child care substitutes?
    - ▶ High cost of LS?
        - ▶ Frictions / constraints
        - ▶ Preferences / choices / high value of maternal care
- ▶ Use external information from Census in 1995 and 2002
    - ▶ Information on time use and child care
    - ▶ Match with child care index at the political district level ($\approx$100)
    - ▶ Cross-sectional variation
        - ▶ Control for selection using observables (Age & Education)

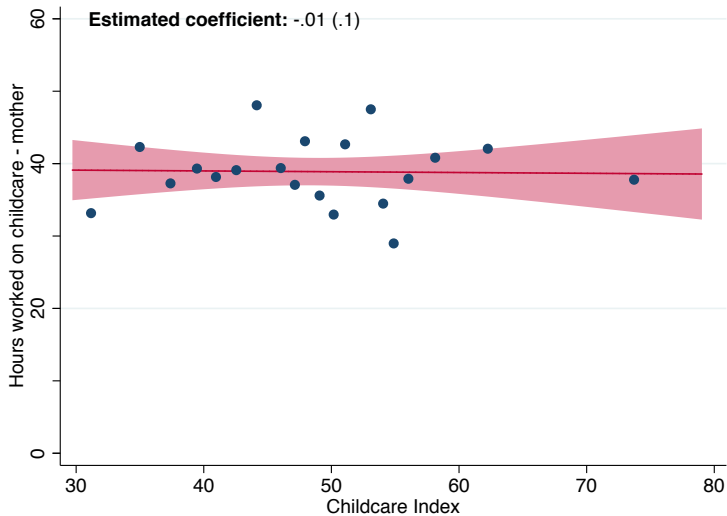# Correlation Btw Child Care Index & Take-Up

With Controls

Estimated coefficient: .36 (.09)
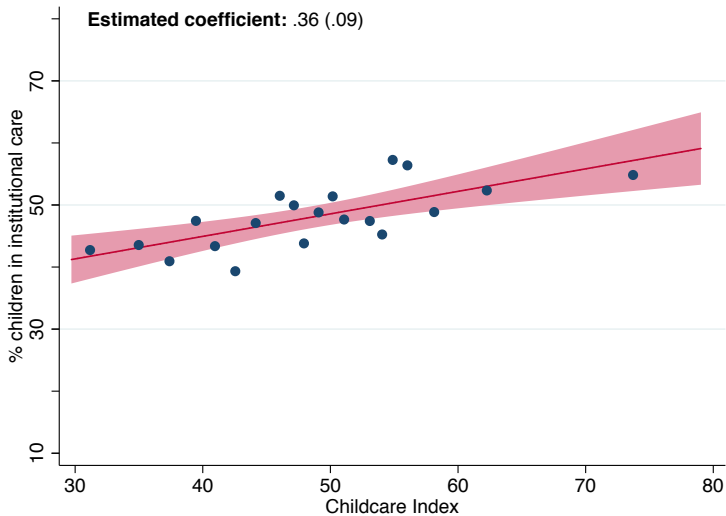
Correlation Btw Child Care Index & Employment

With Controls

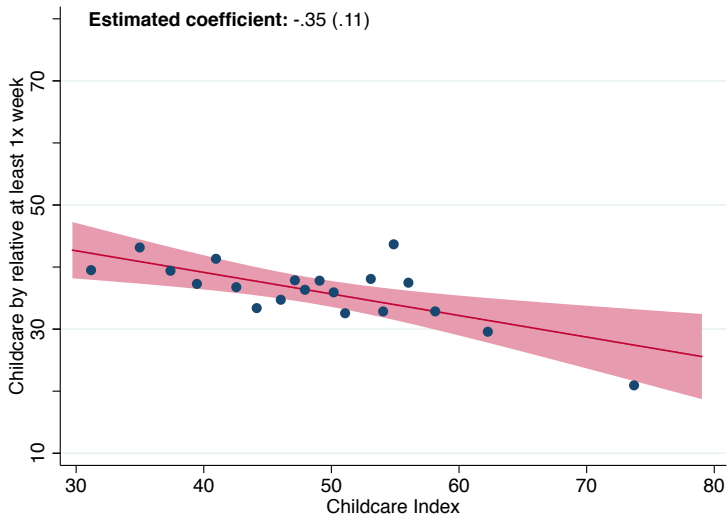

Estimated coefficient: -.04 (.14)
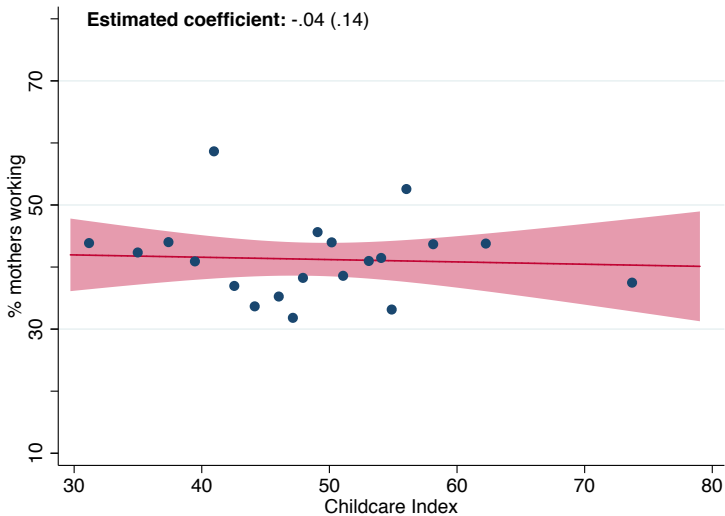
No Controls

Correlation Btw Child Care Index & Maternal Care

With Controls

# Correlation Btw Child Care Index & Alternative Care

With Controls

Estimated coefficient: -.35 (.11)

Y-axis: Childcare by relative at least 1x week

X-axis: Childcare Index

Correlation Btw Index & Child Care Constraints

Non-Working Mothers - With Controls

Estimated coefficient: .13 (.17)
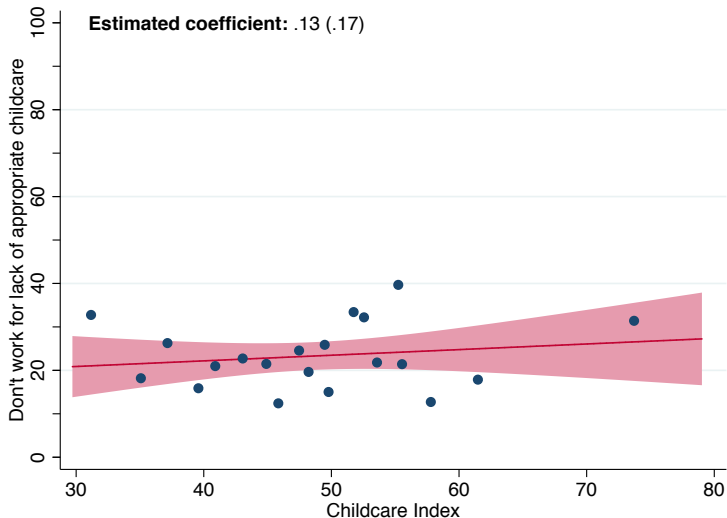
Correlation Btw Index & Preference for Maternal Care

Non-Working Mothers - With Controls

Estimated coefficient: -.38 (.18)
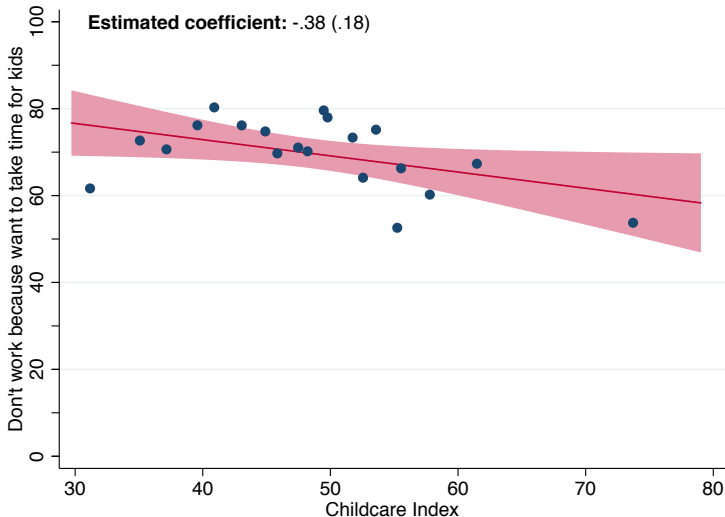
Conclusions

Gender Inequality: Limited Role for Policies?

- ▶ Considerable interest in ability of early childhood policies to shape dynamics of gender inequality

- ▶ We study:
  - ▶ Effects of key bundle of early childhood policies
  - ▶ On full dynamics of relative earnings within HH
  - ▶ In context of large gender inequality & child penalties

- ▶ Family policy has had little effect on gender inequality
  - ▶ Small short run negative effect of PL. No long run effects
  - ▶ Insignficant effect of child care access
  - ▶ No interacted effects

- ▶ Why is more child care not conducive to more labor supply?
  - ▶ Role of choices seems important Life Satisfaction
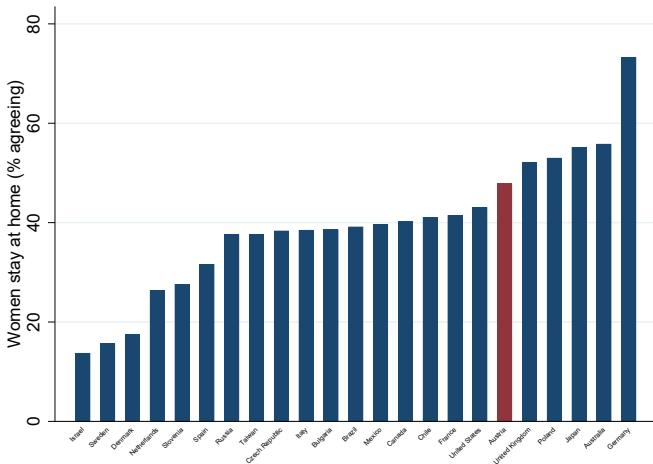 - ▶ Role of norms in explaining these choices Corr. Penalty vs Norm

Additional Figures

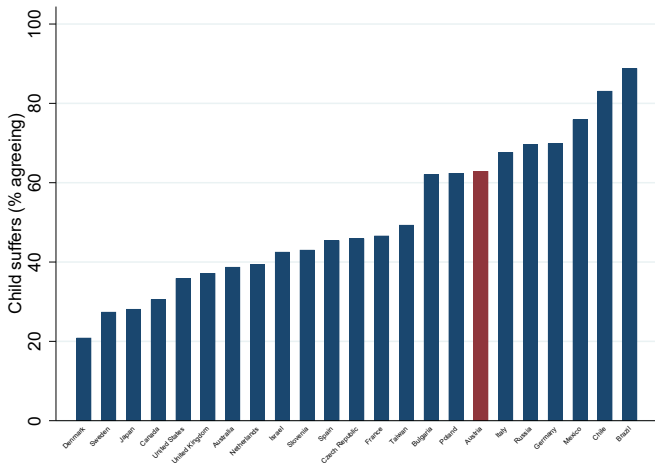# Total Gender Gap in Earnings - Austria (1994-2012)
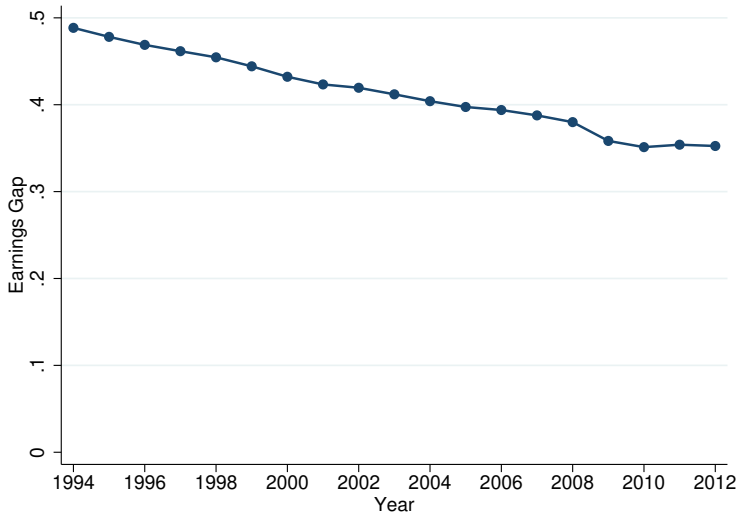
"A Woman Should Stay Home When She Has a Child Under School Age"?

Do You Agree With the Statement

"When a Mother Works for Pay, Her Children Suffer"?

Do You Agree With the Statement

Event Study Approach

▶ Consider men and women who have their first child at event time 0
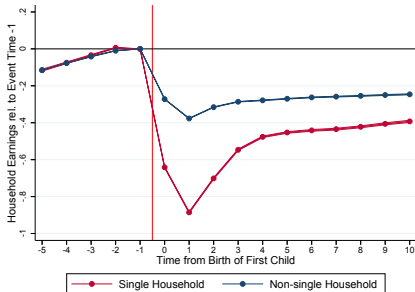
▶ For men and women ($g = m, w$), we regress

$$Y_{ist}^g = \sum_{j \neq -1} \alpha_j^g \cdot \text{EVENT}_{ij} + \text{age/year dummies}$$

where Y_{ist}^g is the outcome for individual i in year s at event time t, and event coefficients α_j^g measure impact relative to event time -1

▶ We show $P_t^g = \hat{\alpha}_t^g / E\left[\tilde{Y}_{ist}^g \mid t\right]$ over time where $\tilde{Y}_{ist}^g$ is the predicted outcome when omitting the event dummies
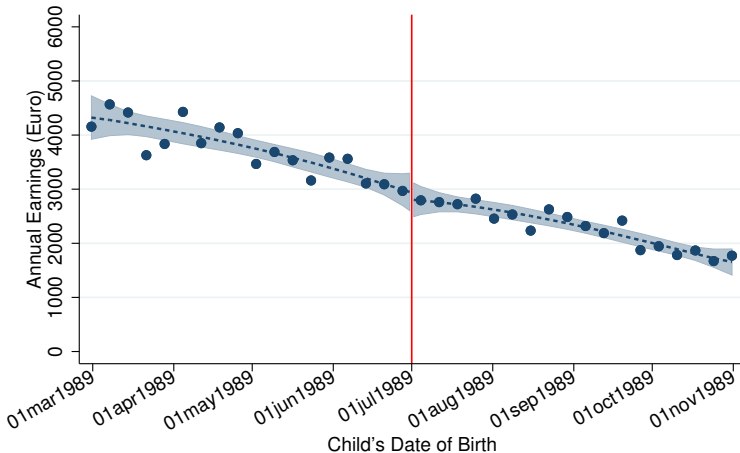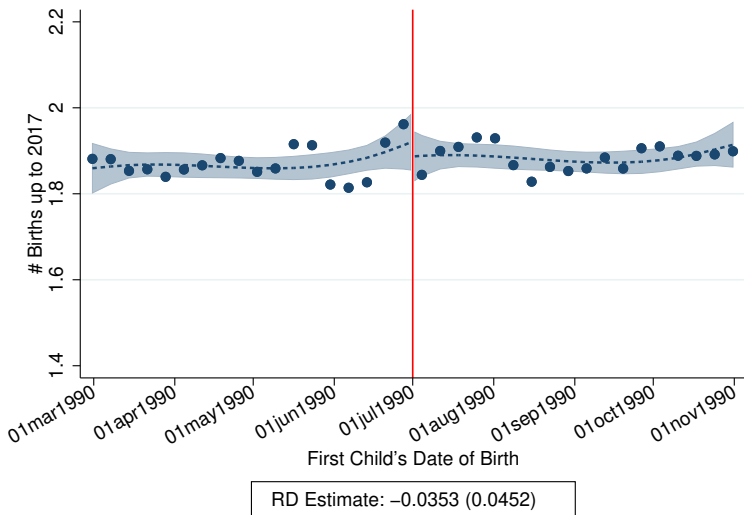
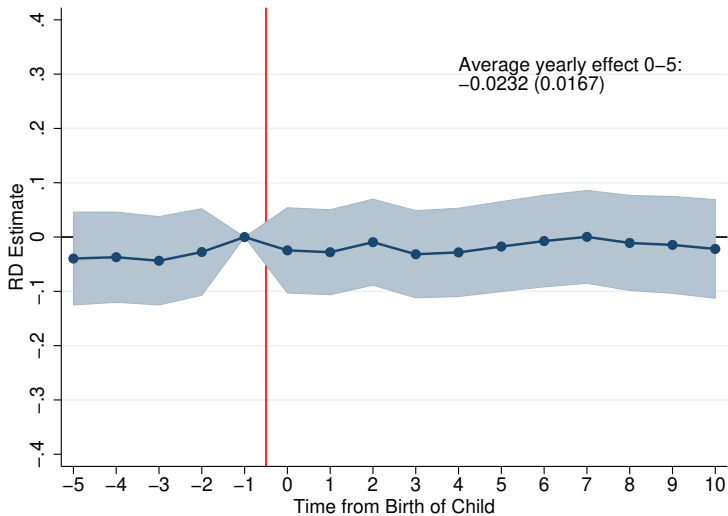# Child Penalty by Family Structure
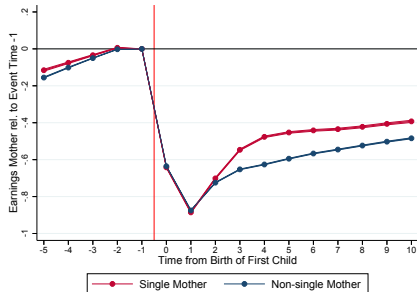
1990 Reform: 1989 Placebo Births

RD Estimate: −129.8 (245.8)
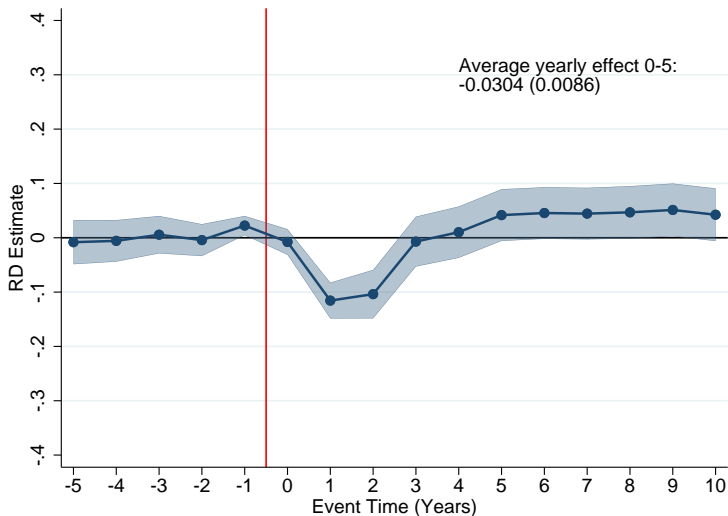Div. by Counterfactual: −0.0090 (0.0171)

1990 Reform: Subsequent Fertility

RD Estimate: −0.0353 (0.0452)

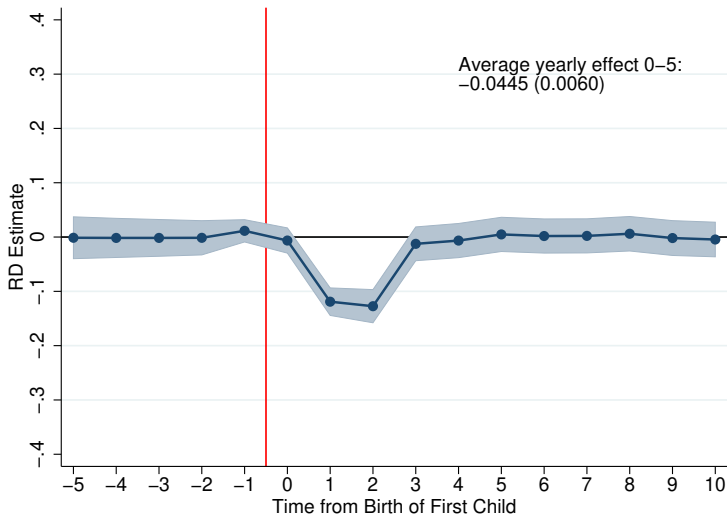# 1990 Reform: Fathers

Average yearly effect 0–5:
−0.0232 (0.0167)

1990 Reform: Accounting For Subsequent Fertility
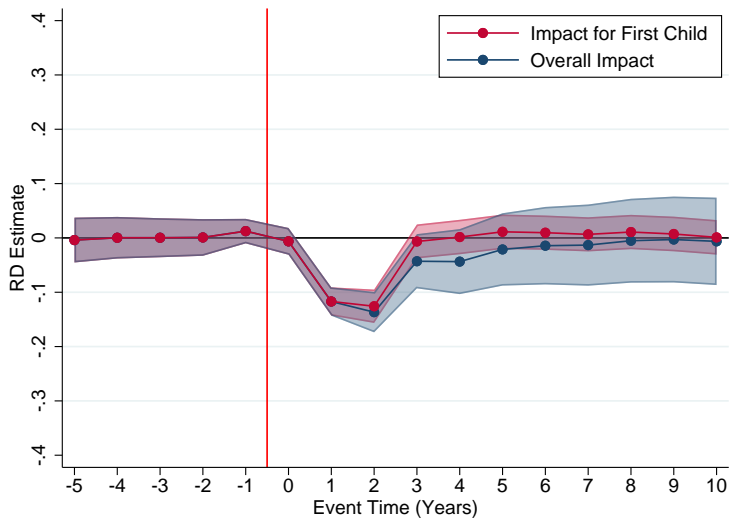
1990 Reform: Women in Top Quartile of Pre-Birth Earnings

Average yearly effect 0-5:
-0.0304 (0.0086)
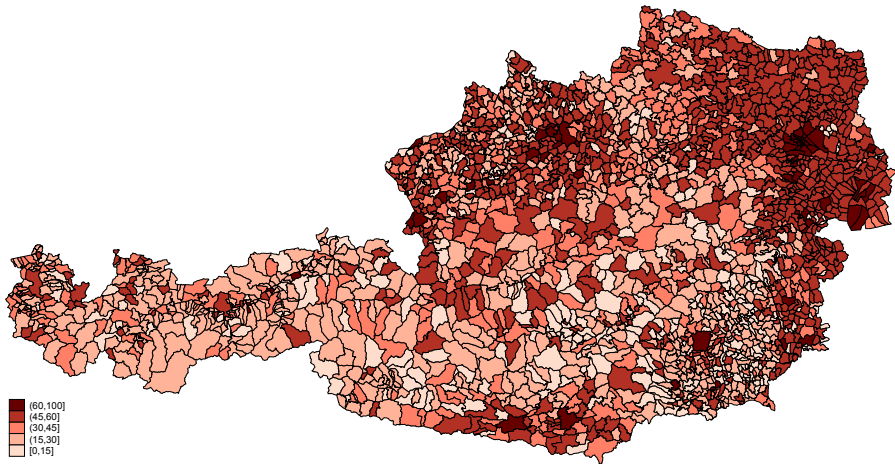
1990 Reform: Dynamic Effects - 1 Child Only

Average yearly effect 0–5:
−0.0445 (0.0060)
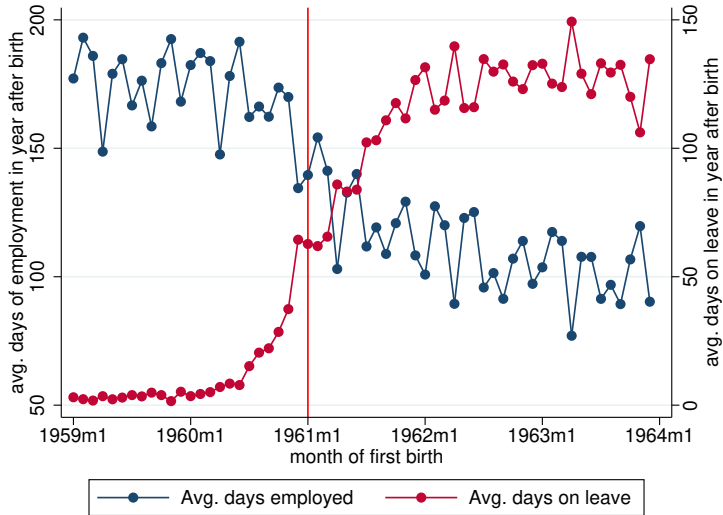
1961 Reform: Take-Up

1961 Reform: Robustness to Trends

Average yearly effect 0–5:
−0.0024 (0.0054)

Back

Spatial pattern of index 1-5 - 2000

Legend:
- (60,100]
- (45,60]
- (30,45]
- (15,30]
- [0,15]
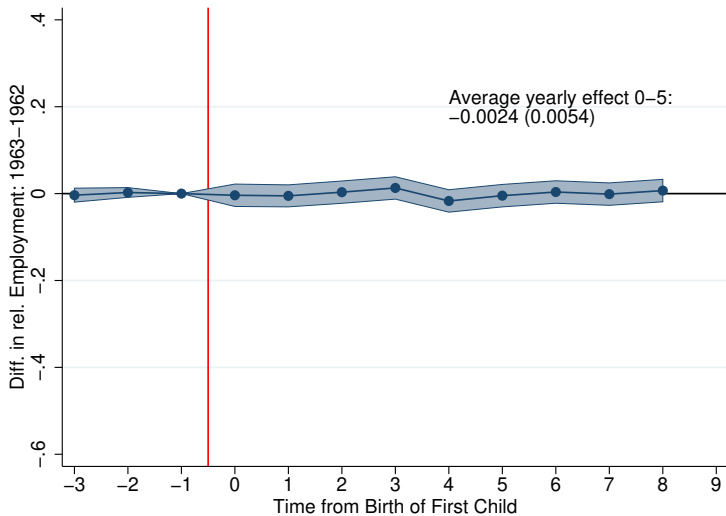
Spatial pattern of index 1-5 - 2010

(60,100]
(45,60]
(30,45]
(15,30]
[0,15]
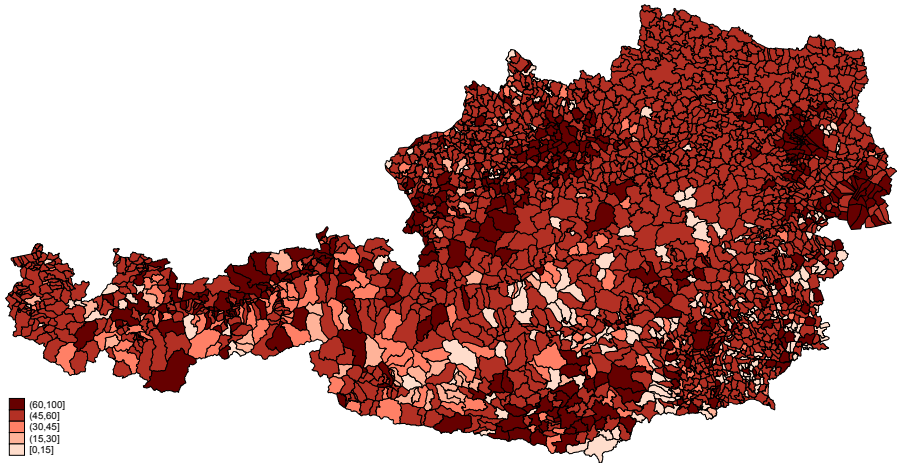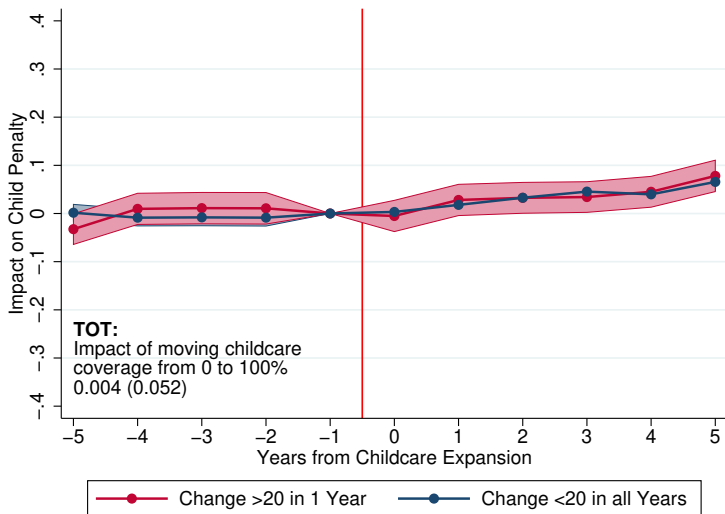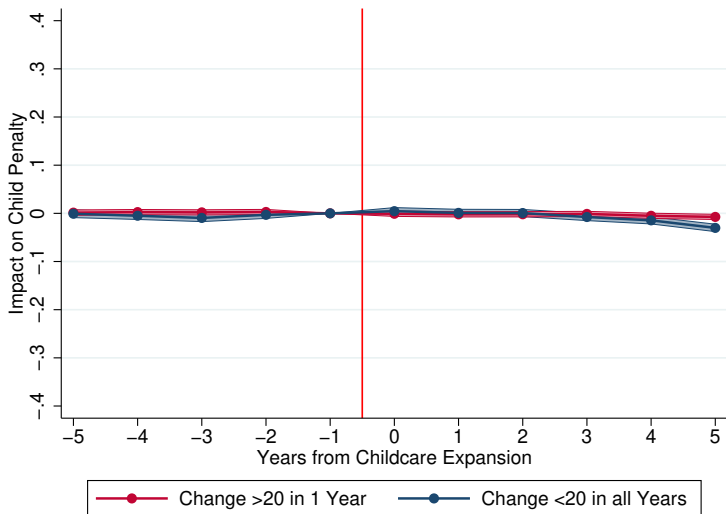
Event study: Index 1-2, take up
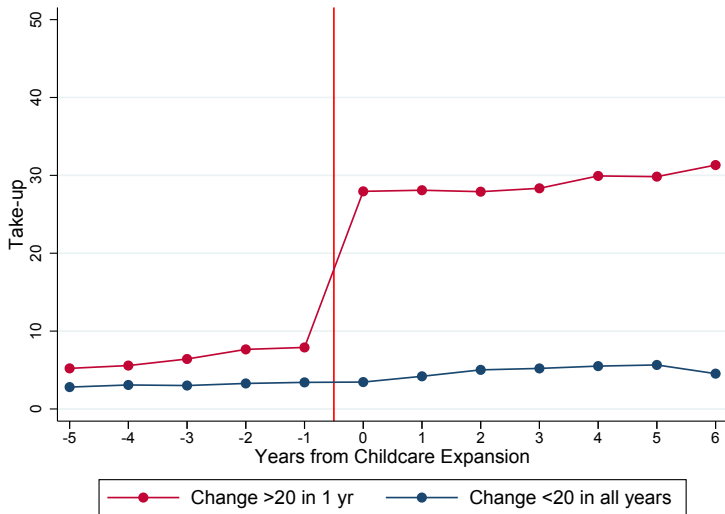
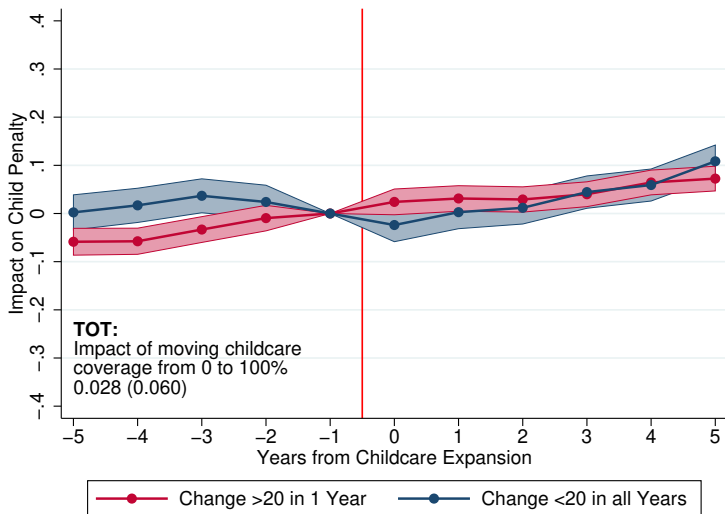# Event study: Index 1-2 employment placebo (1 year before event)
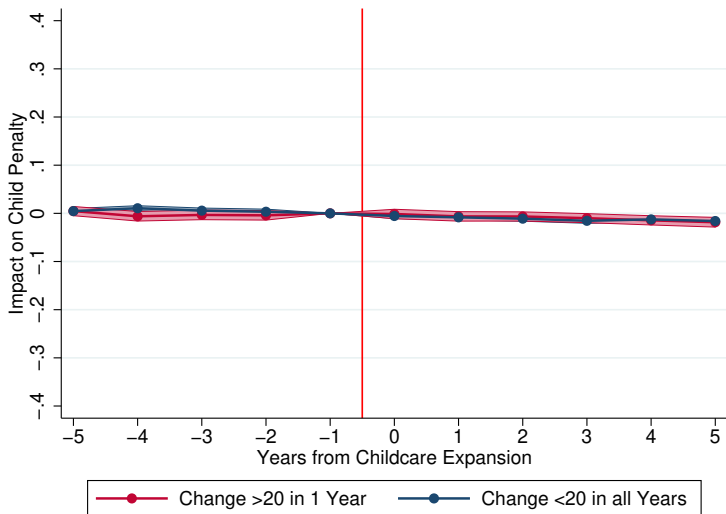
Event study: Index 1-2 cumulative employment 1-2

Event study: Index 3-5 employment placebo (1 year before event)

Event study: Index 3-5 cumulative employment 3-5

Child Penalty by 1st Birth Cohort 1965-2008
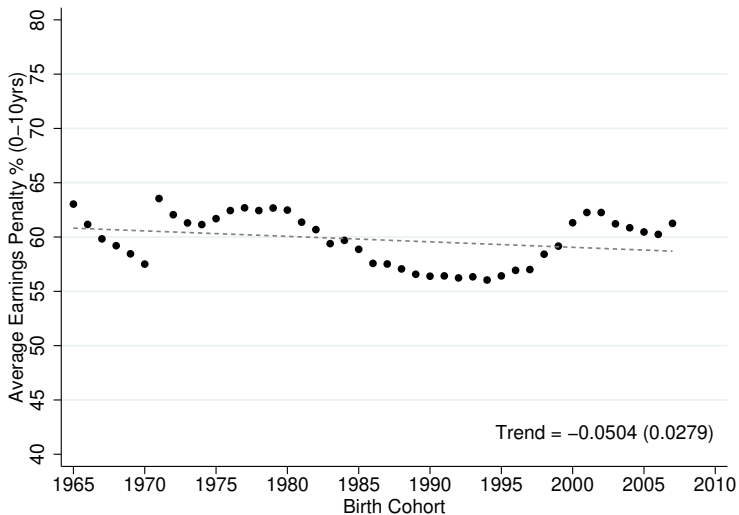
Gender Gap in Earnings 1955-2012
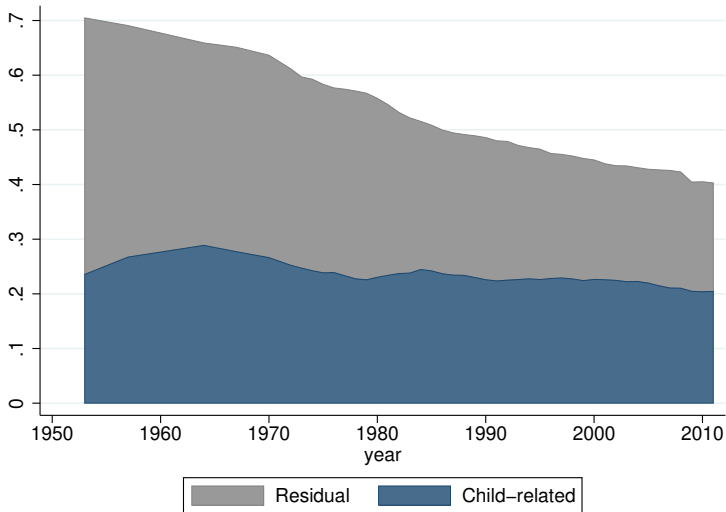
Correlation Btw Child Care Index & Employment

No Controls

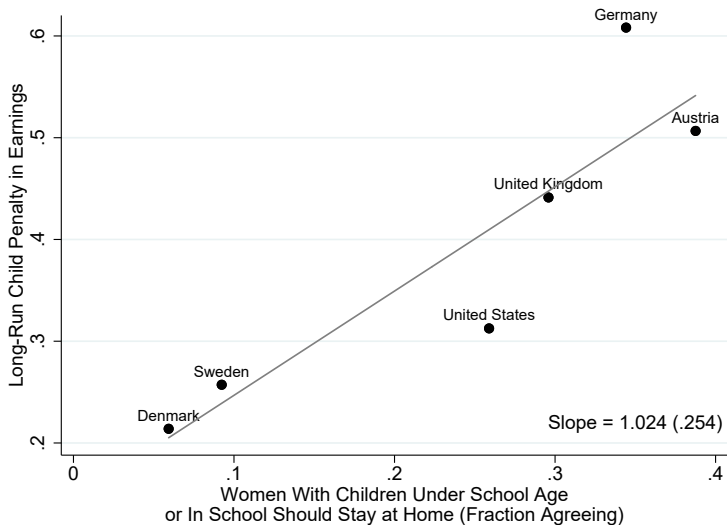**Estimated coefficient:** .14 (.08)
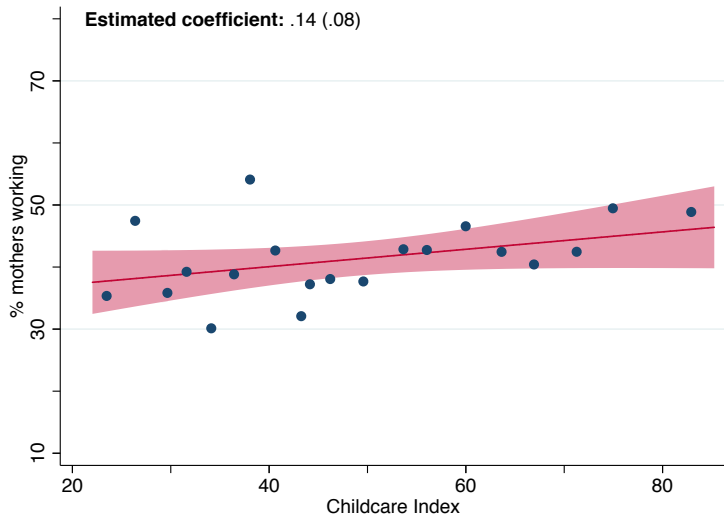
Event Study of Life Satisfaction Around Child Birth

(country, gender) std + year x country FE + age dummies + IFE,
No restriction for balance, Without Korea
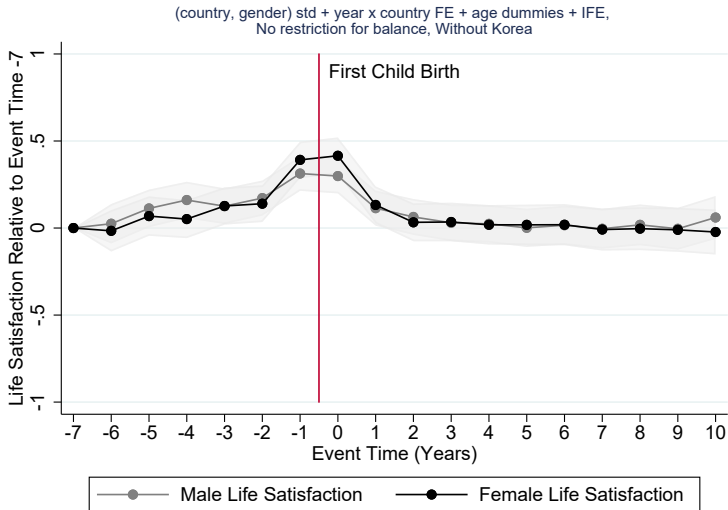
Correlation Btw Penalty and Elicited Gender Norm

Decomposition & Counterfactual GG

▶ Average gender gap in year s :
$$\Delta_s \equiv 1 - E[Y_{ist}^w|s]/\mathsf{E}\left[Y_{ist}^m|s\right]$$

▶ Average counterfactual gender gap in year s absent child penalties for women:
$$\tilde{\Delta}_s \equiv 1 - E[\tilde{Y}_{ist}^w|s]/\mathsf{E}\left[Y_{ist}^m|s\right]$$

▶ Child-related gender gap is:
$$\Delta_s - \tilde{\Delta}_s \equiv E\left[\tilde{Y}_{ist}^w - Y_{ist}^w|s,t\right]/\mathsf{E}\left[Y_{ist}^m|s\right]$$

▶ Estimating avg counterfactual earnings
$$E[\tilde{Y}_{ist}^w|s] = E[Y_{ist}^w|s] - \sum_t \psi_{st} \cdot \mathsf{E}\left[P_{st} \cdot \tilde{Y}_{ist}^w|s,t\right]$$

Decomposition & Counterfactual GG

▶ Causal effects of policy on gender gaps

$$\frac{d\Delta_s}{d\tau_k} = -\frac{dE[Y_{ist}^w|s]/d\tau_k}{\mathsf{E}\left[Y_{ist}^m|s\right]}$$

$$= -\frac{1}{\mathsf{E}\left[Y_{ist}^m|s\right]} \cdot \left\{ \sum_t \psi_{st} \cdot \frac{dP_t}{d\tau_k}(\tau_{PL}, \tau_N, \tau_{PS}) \cdot \mathsf{E}\left[\tilde{Y}_{ist}^w|s,t\right] \right\}$$

▶ Causal effects of policy on gender gaps (with fertility effects)

$$\frac{d\Delta_s}{d\tau_k} = -\frac{dE[Y_{ist}^w|s]/d\tau_k}{\mathsf{E}\left[Y_{ist}^m|s\right]}$$

$$= -\frac{1}{\mathsf{E}\left[Y_{ist}^m|s\right]} \cdot \left\{ \sum_t \psi_{st} \cdot \frac{dP_t}{d\tau_k} \cdot \mathsf{E}\left[\tilde{Y}_{ist}^w|s,t\right] + \sum_t \frac{d\psi_{st}}{d\tau_k} \cdot P_{st} \cdot \mathsf{E}\left[\tilde{Y}_{ist}^w|s,t\right] \right\}$$

Related Literature

▶ Literature on career costs of children
  ▶ ...

▶ LIterature on labor supply responses to parental leave policies
  ▶ Magne, etc.

▶ Literature on labor supply responses to child care
  ▶ Macro effects: Child care expansions
  ▶ Micro effects: eligibility variation
  ▶ Mixed results. Mostly focus on contemporaneous labor supply