

Lecture 1: The Child Penalty

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Zeuthen Lectures
Copenhagen, September 2021

“One hierarchy has been of supreme importance in all known human societies: the hierarchy of gender. People everywhere have divided themselves into men and women. And almost everywhere men have got the better deal, at least since the agricultural revolution”

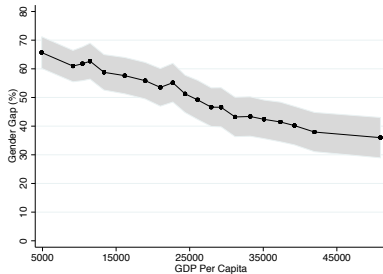
“Is the division into men and women a product of the imagination, like the caste system in India or the racial system in America, or is it a natural division with deep biological roots?”

From Sapiens by Yuval Noah Harari

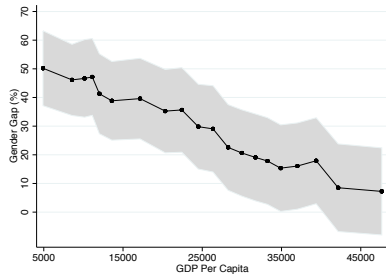
Gender Inequality Declines with Development

Kleven & Landais (2017)

Gender Gap in Earnings



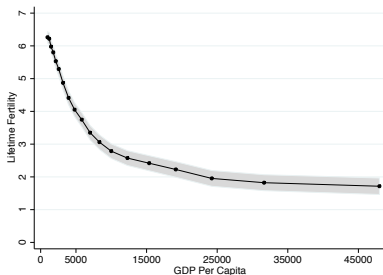
Gender Gap in Employment



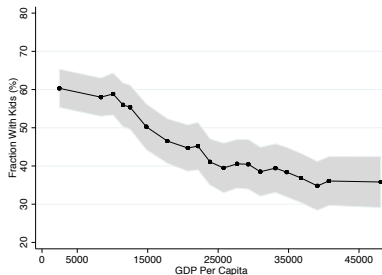
Fertility Declines with Development

Kleven & Landais (2017)

Women Have Fewer Children
Lifetime Fertility Per Woman



Women Have Children Later
Fraction of 16-40 Year Olds with Children



Are Gender Inequality and Fertility Linked?

- ▶ How much of gender inequality can be explained by children?
- ▶ **The child penalty** (aka the motherhood penalty):
 - ▶ The causal impact of having children on the outcomes of women relative to men
- ▶ Questions:
 - ▶ How do we estimate the child penalty?
 - ▶ How large is it?
 - ▶ How does it vary across time and space?
 - ▶ What are the underlying determinants?

Estimating Causal Impacts of Children

- ▶ Fertility choices are endogenous
 - ▶ Correlation does not mean causality
- ▶ The hunt for random variation in fertility:
 - ▶ Sibling sex mix (Angrist & Evans 1998)
 - ▶ IVF treatment success (Lundborg, Plug & Rasmussen 2017)
- ▶ These approaches are clever, but also limited
 - ▶ External validity (very particular treatment effects and samples)
 - ▶ Statistical power (small samples)

Broadening the Agenda

- ▶ Broadening the agenda relative to the earlier literature
 - ▶ Estimate the full impact of children in the population
 - ▶ Estimate child penalties and link them to gender inequality
 - ▶ Build a global database of child penalties
 - ▶ Ask *why* child penalties always fall on women
- ▶ Acknowledgements
 - ▶ Agenda first launched with Camille Landais & Jakob Søgaard
 - ▶ Others have joined since (Anna Hotz, Johanna Posch, Andreas Steinhauer, & Josef Zweimüller)

Child Penalty: Estimation and Results

Event Study Approach

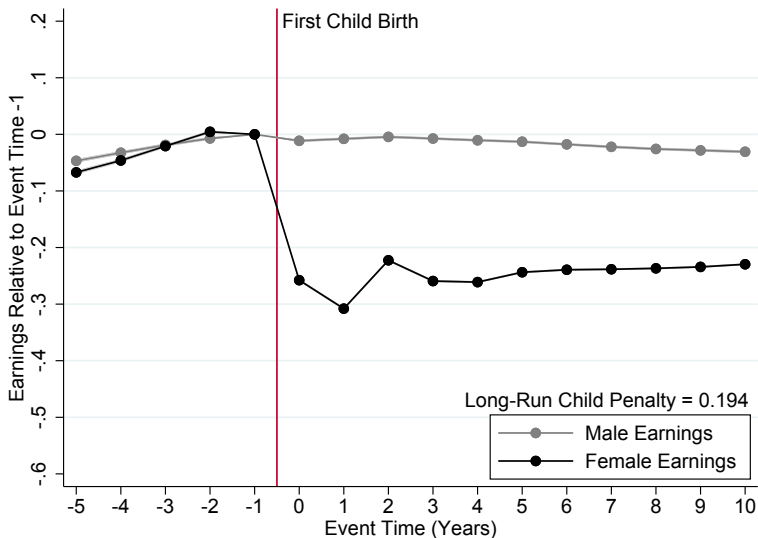
Kleven, Landaïs & Søgaaard (2019)

- ▶ Use panel data on labor market outcomes for men and women who become parents
- ▶ Denote event time by t (year of first child birth is $t = 0$)
- ▶ Plot outcomes for men and women at each event time t , relative to the year before first birth $t = -1$
 - ▶ Control flexibly for time trends and lifecycle trends by gender
- ▶ Look for sharp changes in outcomes around $t = 0$

Specification

Child Penalty in Earnings

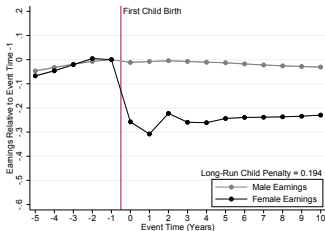
Evidence from Denmark



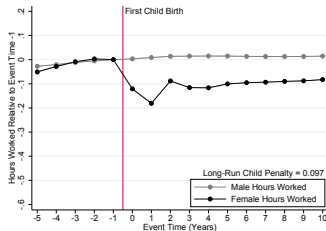
Anatomy of Child Penalty

Evidence from Denmark

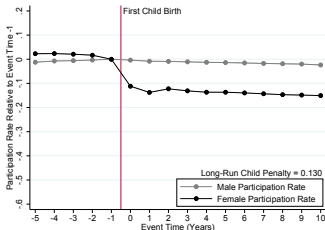
Earnings



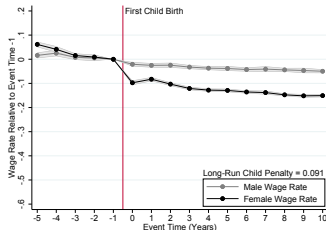
Hours Worked



Employment



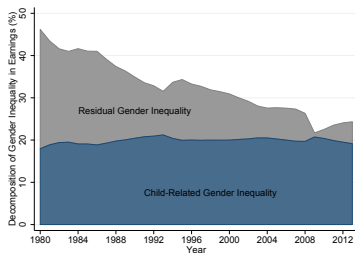
Wage Rates



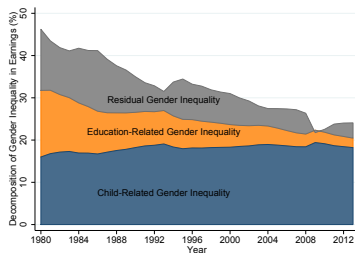
Decomposing Gender Inequality

How Much do Child Penalties Explain?

Without Education



With Education



Are Child Penalties Causal?

- ▶ Identification assumptions:

- ▶ Short-run penalty relies on smoothness around $t = 0$
- ▶ Long-run penalty relies on parallel trends between men and women, conditional on controls for time and lifecycle trends

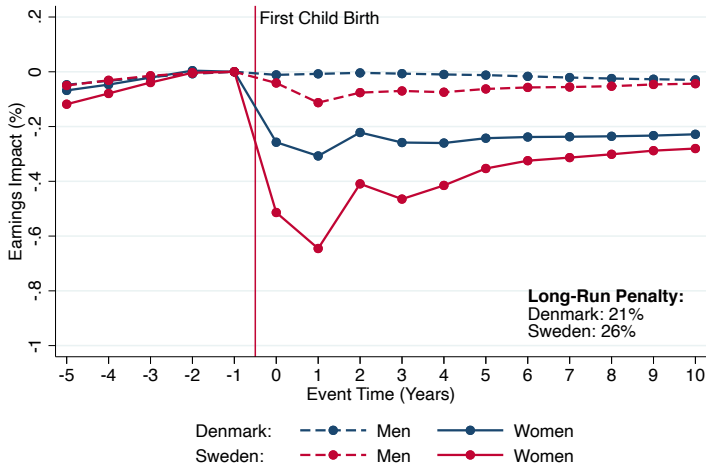
- ▶ Identification validation:

- ▶ Use people who never had children as controls With vs Without Children
- ▶ Use instrument for child birth Sibling Sex Mix

Geographical Variation: Across Countries

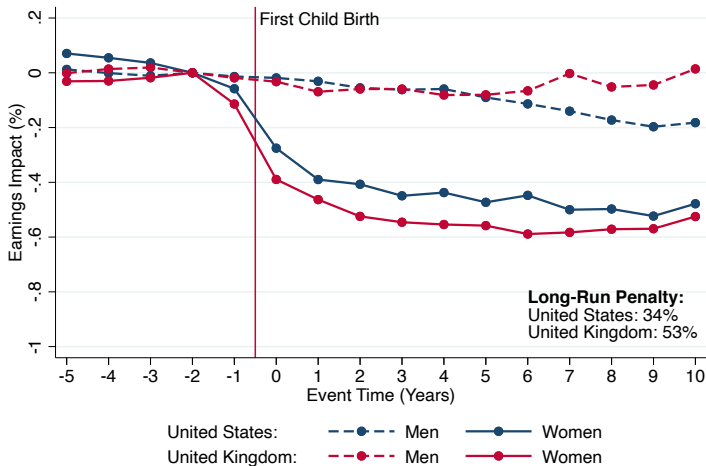
Denmark and Sweden

Earnings Penalty



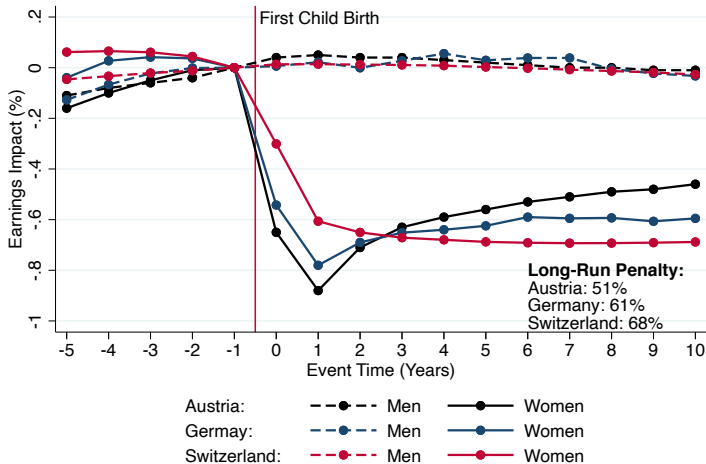
United States and United Kingdom

Earnings Penalty

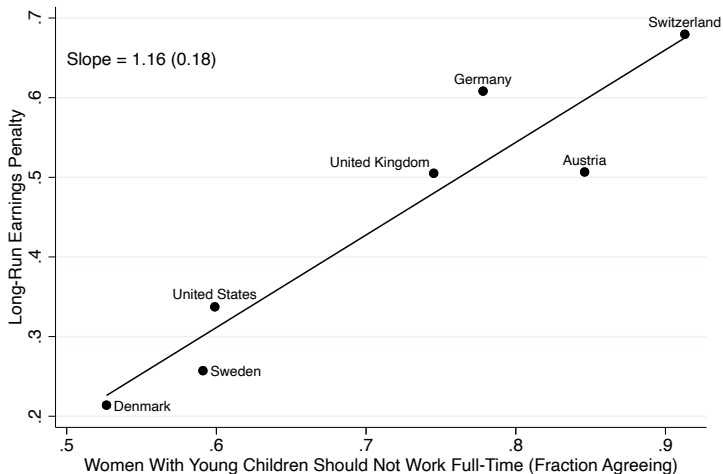


Germany, Austria, and Switzerland

Earnings Penalty



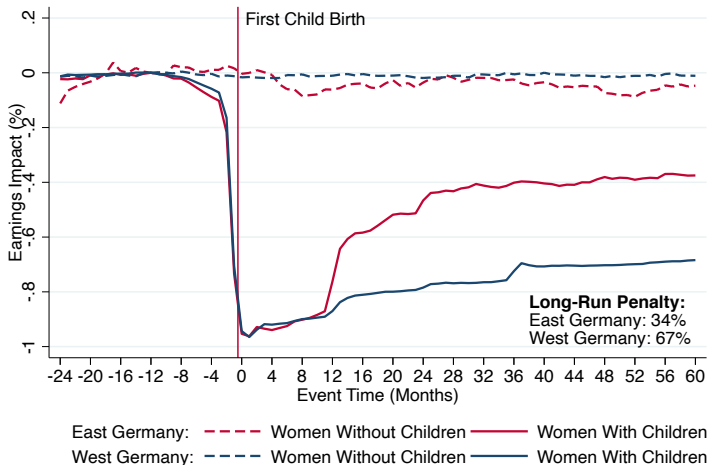
Earnings Penalties vs Social Norms



Geographical Variation: Within Countries

Germany: East vs West

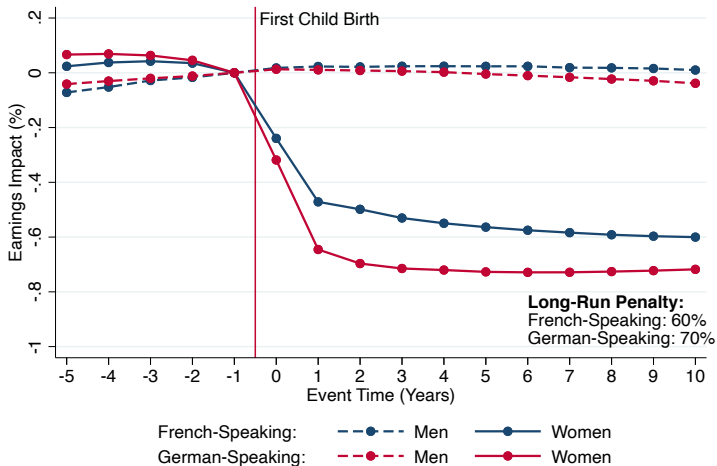
Earnings Penalties



Source: Data from Bönke, Glogowsky, Hansen, Lüthen, and Sachs (2019)

Switzerland: French vs German Regions

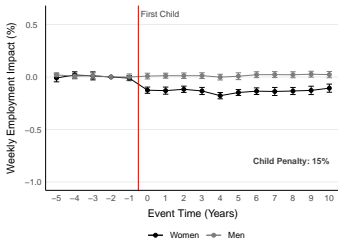
Earnings Penalties



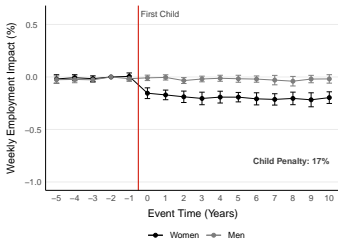
US States

Employment Penalties

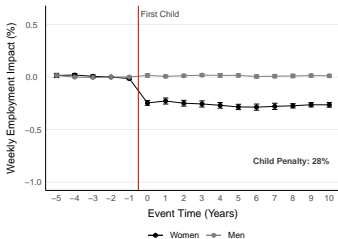
North Dakota



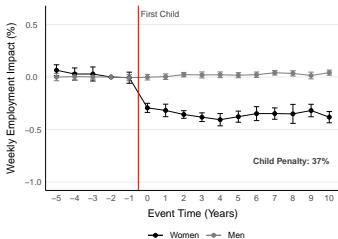
Washington DC



California



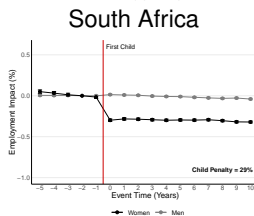
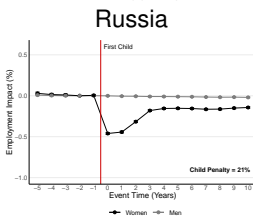
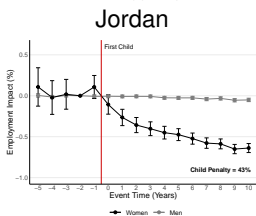
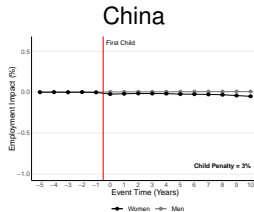
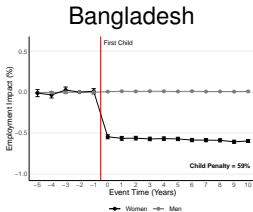
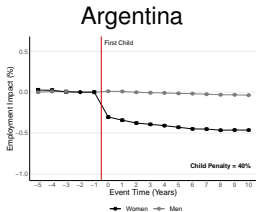
Utah



Geographical Variation: Building a Global Database

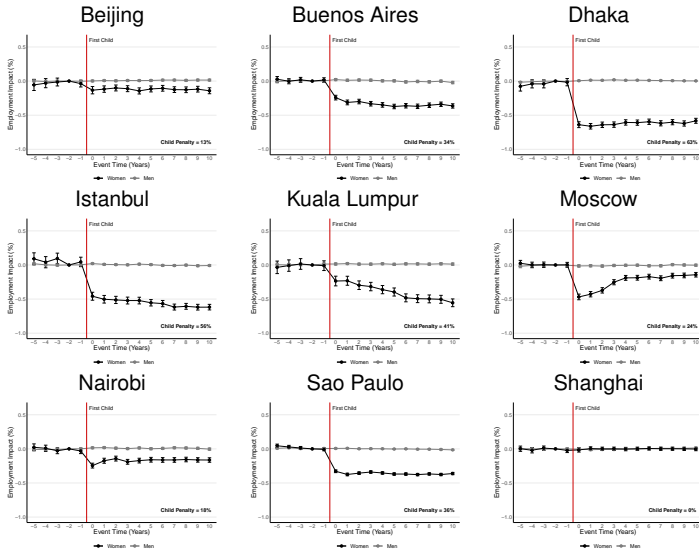
Child Penalties Around the World

Employment Penalties by Country



Child Penalties Around the World

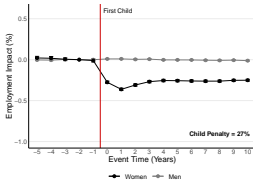
Employment Penalties by City



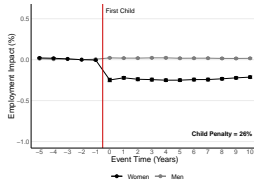
Child Penalties Around the World

Employment Penalties by Continent

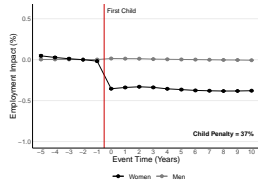
Europe



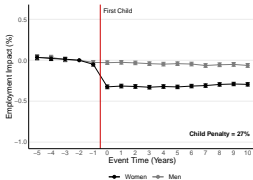
North America



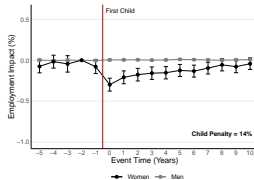
Latin America



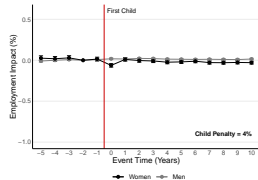
Oceania



Asia



Africa



What Explains Child Penalties?

Possible Explanations

1. Biology

- ▶ Hard-wired
- ▶ Birth-related Evidence

2. Comparative Advantage

- ▶ Education and earnings capacity Evidence

3. Public Policy

- ▶ Parental leave Evidence
- ▶ Child care Evidence
- ▶ Welfare Evidence

4. Employer Discrimination Evidence

5. Gender Norms and Culture

6. General Equilibrium

- ▶ Child care: family network, market-provision
- ▶ Job flexibility: industrial composition, family friendliness Evidence

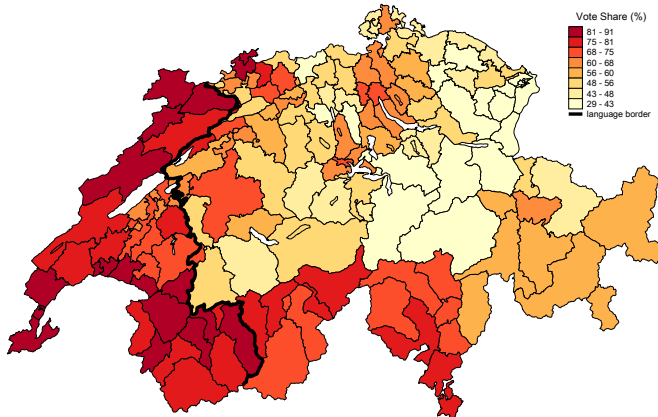
Gender Norms and Culture: Evidence from Switzerland

Switzerland is Gender Conservative

- ▶ Gender beliefs:
 - ▶ 91% believe that women with young children (preschool or school age) should not work full-time Child Penalties vs Gender Beliefs
 - ▶ 48% believe that a preschool child will suffer if the mother works
- ▶ Women's right to vote:
 - ▶ Introduced in 1971 at the federal level
 - ▶ Introduced between 1959-1990 at the canton level
- ▶ A new measure of gender norms:
 - ▶ Hotz, Kleven, Landais, Steinhauer & Zweimüller (2021)
 - ▶ Measure the gender progressivity of a place by the fraction voting yes to women's suffrage in the 1971 federal referendum

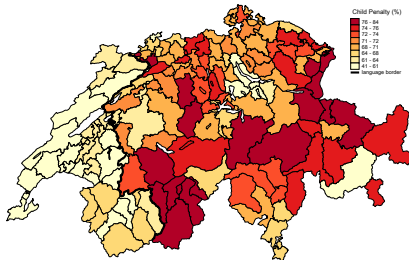
Heat Map of Votes on Women's Suffrage

Fraction Voting Yes in 1971

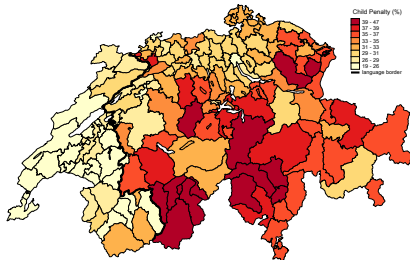


Heat Map of Child Penalties

Earnings Penalties

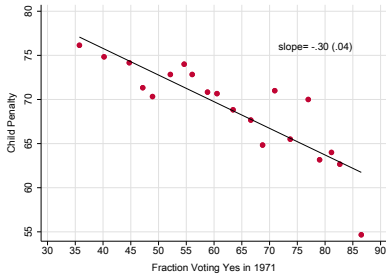


Employment Penalties

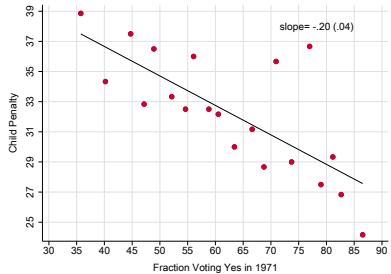


Child Penalties vs Votes on Women's Suffrage

Earnings Penalties



Employment Penalties



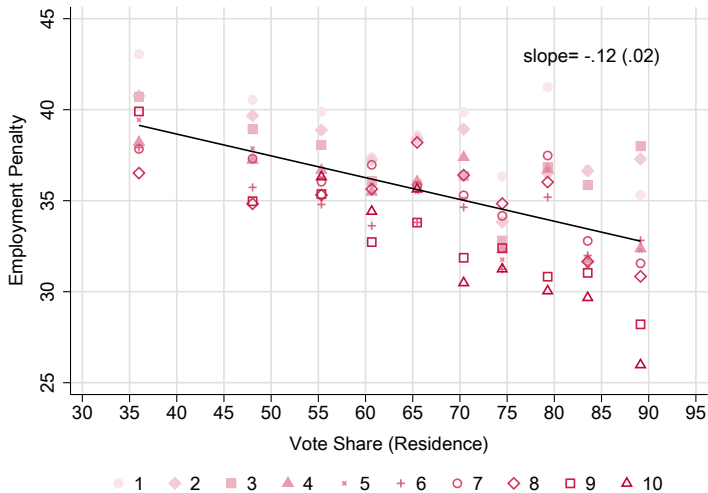
Epidemiological Approach

Hotz, Kleven, Landais, Steinhauer & Zweimüller (2021)

- ▶ This approach identifies the effect of culture by comparing individuals living in the same environment, originating from different environments
 - ▶ The typical focus has been on immigrants or their descendants in a given host country coming from different source countries
- ▶ We innovate on the epidemiological approach:
 1. **Granularity:** Moves between municipalities within a country
 2. **Two-way place effects:**
 - ▶ Effect of birth place conditional on residence place (childhood environment)
 - ▶ Effect of residence place conditional on birth place (adult environment)
 3. **Outcome** (child penalty) and **norms measure** (women's suffrage)

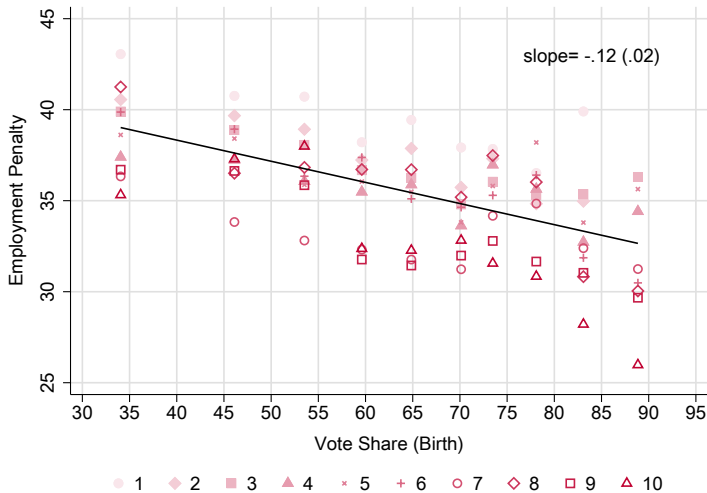
Effect of Residence Place

Holding Birth Place Constant



Effect of Birth Place

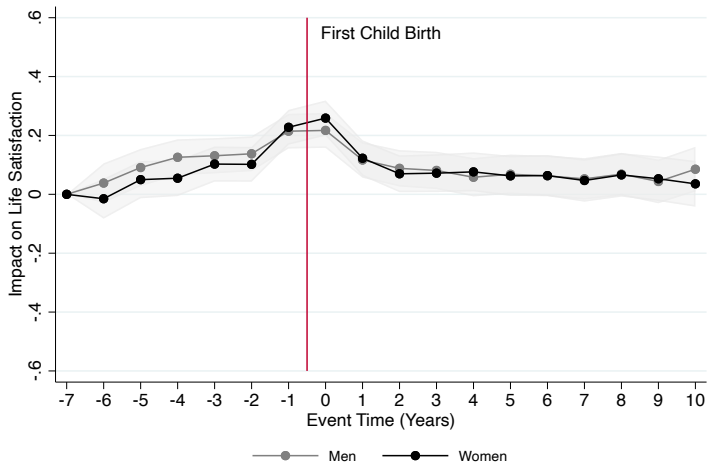
Holding Residence Place Constant



Is the Child Penalty Also
a Happiness Penalty?

Child Penalty in Life Satisfaction

Data from Australia, Germany, Netherlands, Switzerland, and the UK



The Missing Life Satisfaction Penalty

▶ **Adaptation**

- ▶ The idea that people adapt to life events (positive or negative) over time → the hedonic treadmill

▶ **Benefits of children**

- ▶ Earnings penalty: cost side of children
- ▶ Life satisfaction penalty: cost and benefit side of children
- ▶ Benefits may be unequally distributed on men and women

▶ **Life satisfaction as a public good within families**

- ▶ Life satisfaction spillovers between spouses

Conclusion

Conclusion

- ▶ The breadwinner-homemaker institution is among the most universal and stable in human history
 - ▶ Child penalties are large and persistent almost everywhere
- ▶ Even so, child penalties are not fixed
 - ▶ There is large variation across space and over time
- ▶ Are child penalties deeply rooted or a social construct?
 - ▶ Specialization is efficient, but why is it so gendered?
 - ▶ Evidence suggests an important role for norms and culture
 - ▶ More on this in the next lecture

Appendix

Event Study Specification

Kleven, Landais & Søgaaard (2019)

► Regression for each gender:

$$Y_{it} = \alpha' D_{it}^{Event} + \beta' D_{it}^{Age} + \gamma' D_{it}^{Year} + \nu_{it}$$

where α is a vector of child impacts at each event time t

► Percentage impact on gender g :

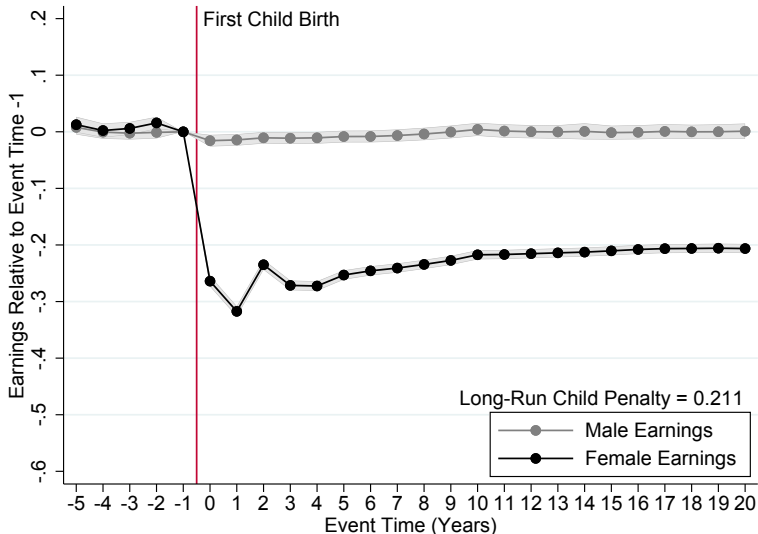
$$P_t^g \equiv \frac{\hat{\alpha}_t^g}{E \left[\tilde{Y}_{it}^g \mid t \right]}$$

where \tilde{Y}_{it}^g is the counterfactual outcome absent children

► Child penalty:

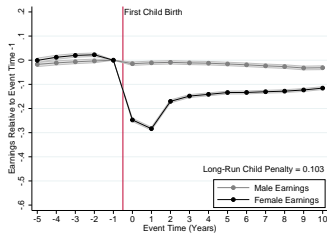
$$\text{Child Penalty}_t \equiv P_t^m - P_t^w$$

Long-Run Earnings Penalties

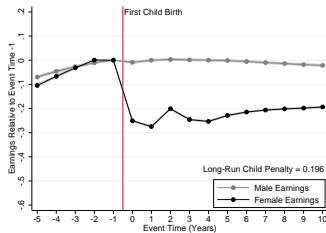


Child Penalties by Number of Children

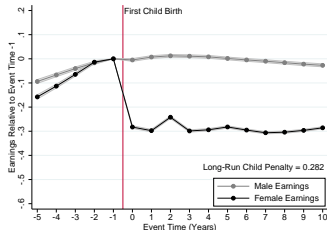
1 Child



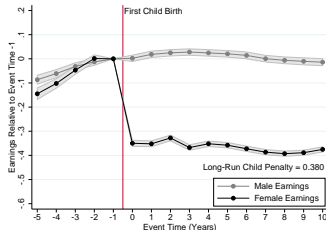
2 Children



3 Children

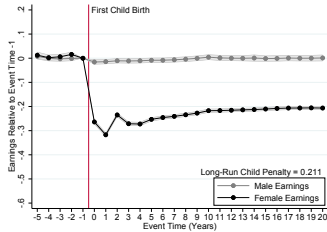


4+ Children

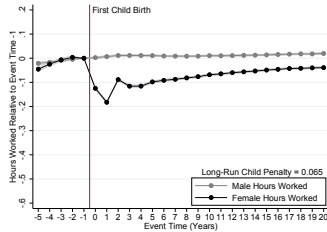


Anatomy of Long-Run Penalties

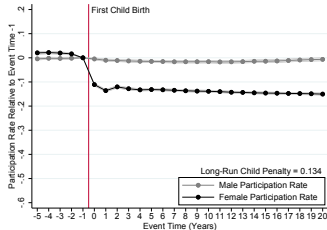
Earnings



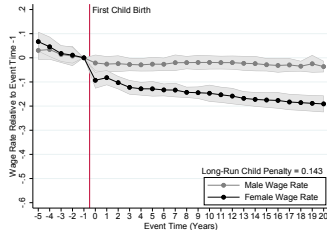
Hours Worked



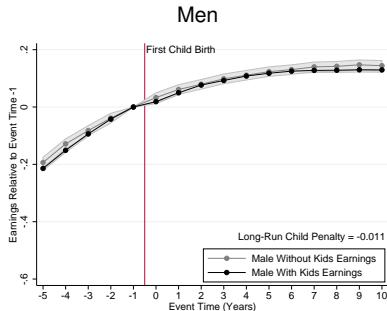
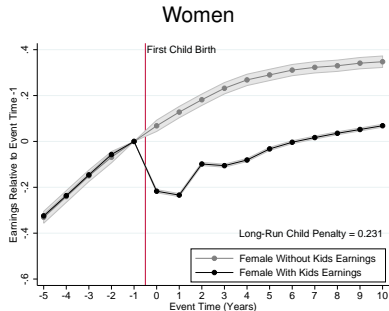
Employment



Wage Rates



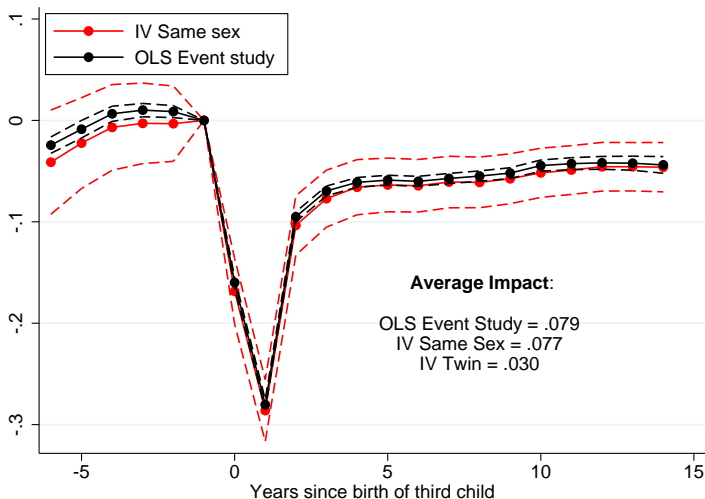
Women/Men Who Have Children vs Those Who Don't



[Back](#)

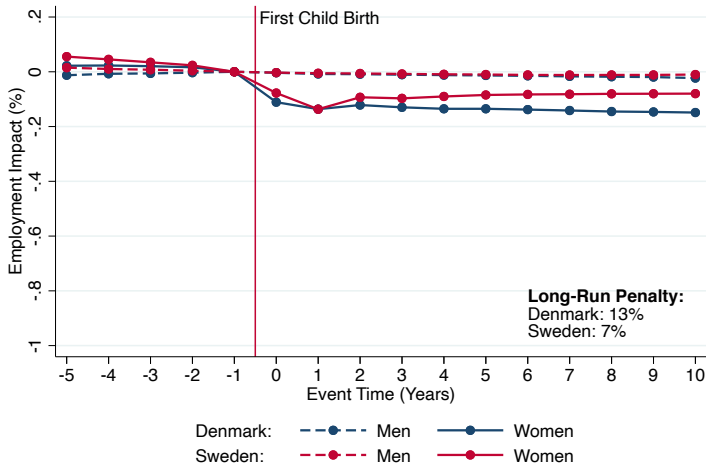
Marginal Effect of the Third Child

OLS Event Study vs IV Same-Sex Event Study



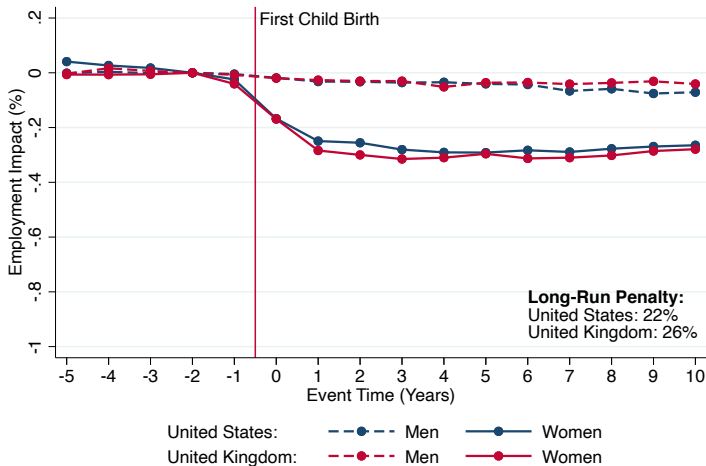
Denmark and Sweden

Employment Penalty



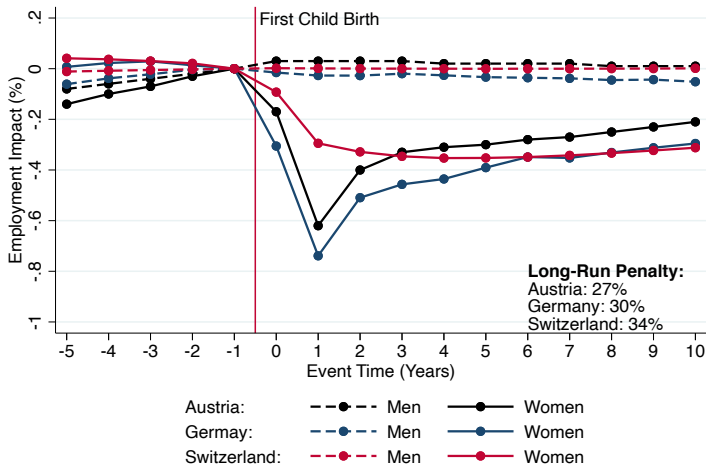
United States and United Kingdom

Employment Penalty

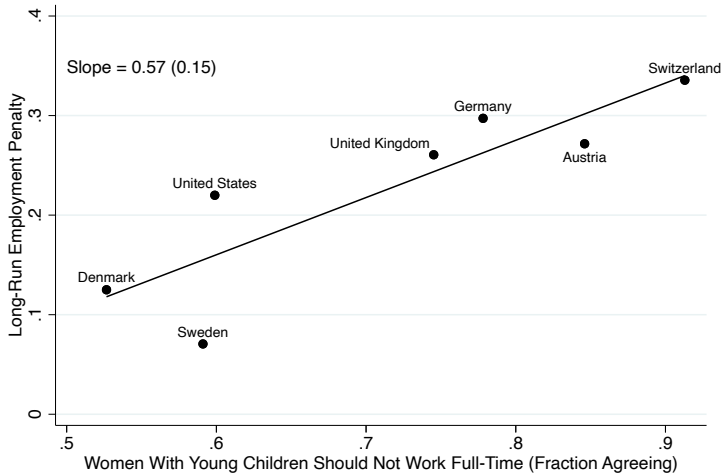


Germany, Austria, and Switzerland

Employment Penalty

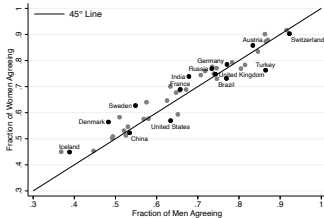


Employment Penalties vs Social Norms

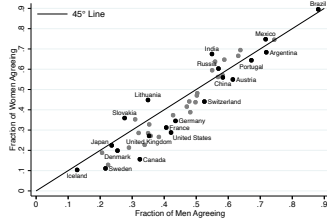


Men and Women Share Gender Beliefs

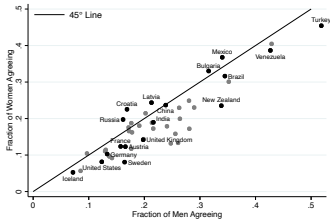
Women with Young Children
Should Not Work Full-Time



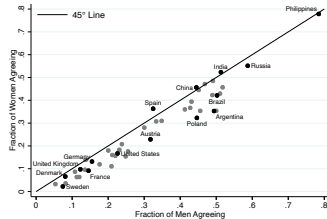
Preschool Children Suffer
if Their Mother Works



Working Mother Cannot Have a
Warm Relationship with Children

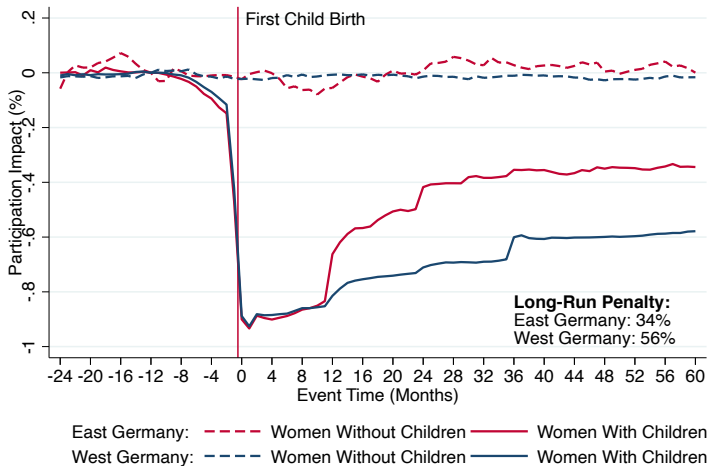


Men Should Work,
Women Should Stay Home



Germany: East vs West

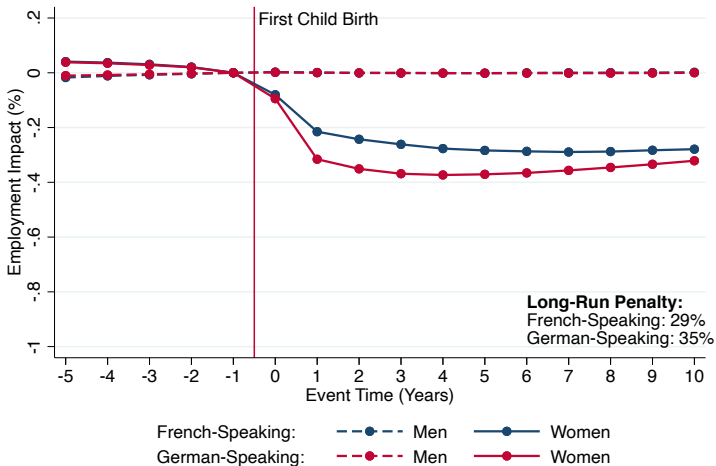
Employment Penalties



Source: Data from Bönke, Glogowsky, Hansen, Lüthen, and Sachs (2019)

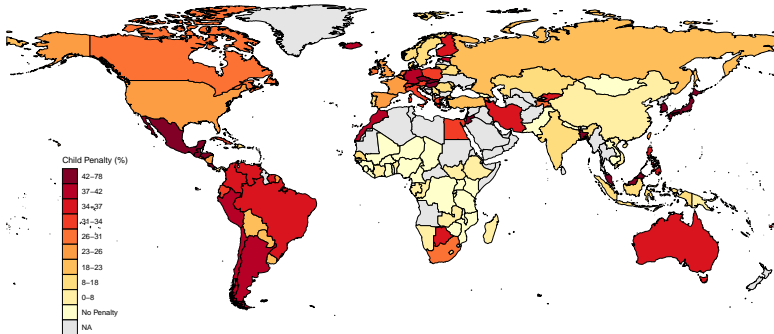
Switzerland: French vs German Regions

Employment Penalties



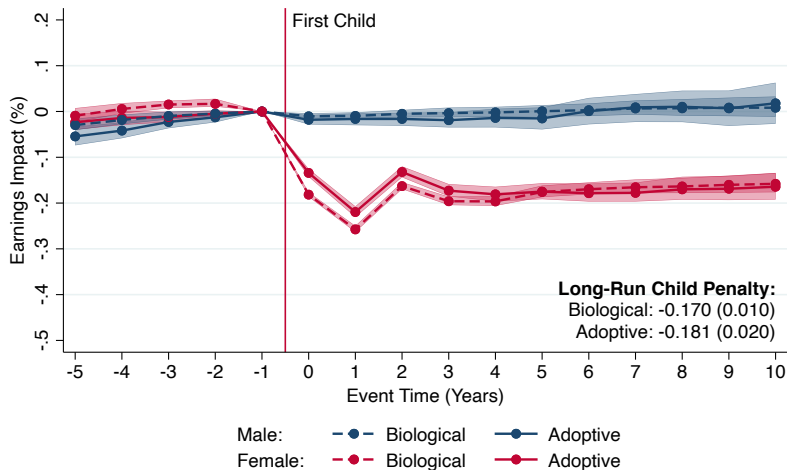
World Map of Child Penalties

Employment Penalties



Biological vs Adoptive Families in Denmark

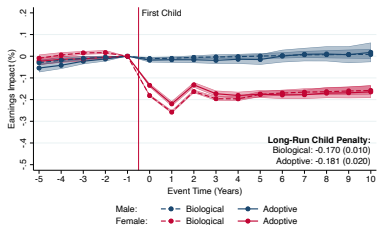
Earnings Penalties



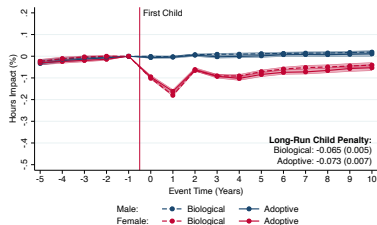
Biological vs Adoptive Families in Denmark

Anatomy of Earnings Penalties

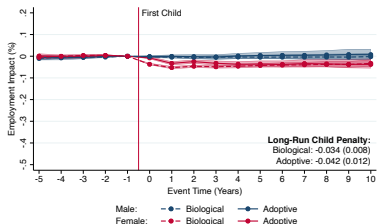
Earnings



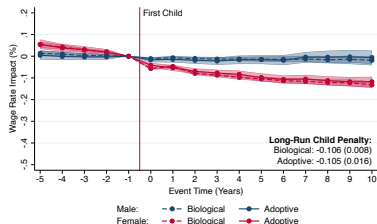
Hours Worked



Employment

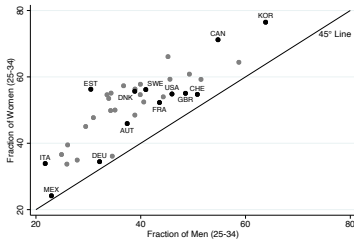


Wage Rates



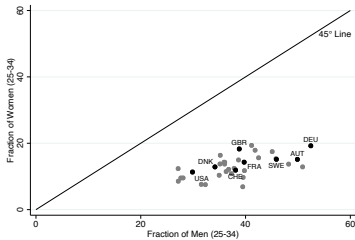
Education By Gender

Fraction with Higher Education Degree*



* Higher education degrees include short-cycle tertiary degrees, Bachelor's degrees, Master's degrees, and doctoral degrees

Fraction with STEM Degree*



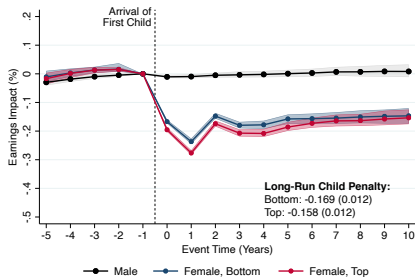
* STEM degrees include degrees in science, technology, engineering, or mathematics

Source: Bertrand (2020) [with updated data]

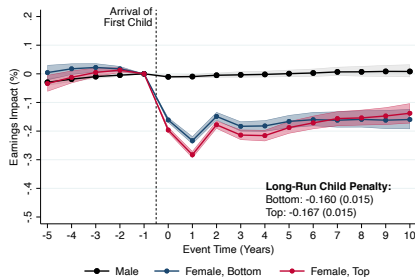
Child Penalties by Female Earnings Capacity

Using Education Degree/Field to Predict Earnings Capacity (Danish Data)

Top vs Bottom Half of
Female Earnings Capacity (Relative to Males)



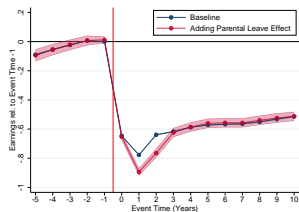
Top vs Bottom Quartile of
Female Earnings Capacity (Relative to Males)



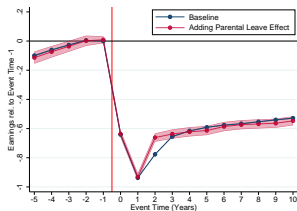
Parental Leave Reforms in Austria

Impact on Child Penalties

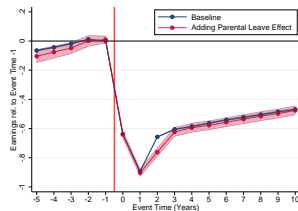
1990 Reform: 12 to 24 Months



1996 Reform: 24 to 18 Months



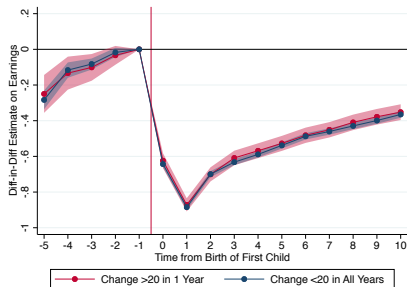
2000 Reform: 18 to 30 Months



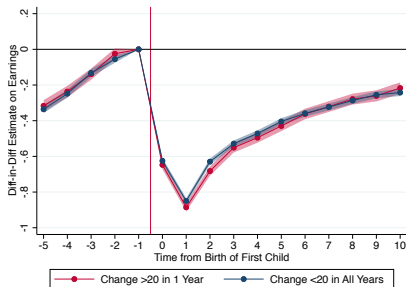
Child Care Expansions in Austria

Impact on Child Penalties

Nursery Care Expansions (Ages 1-2)



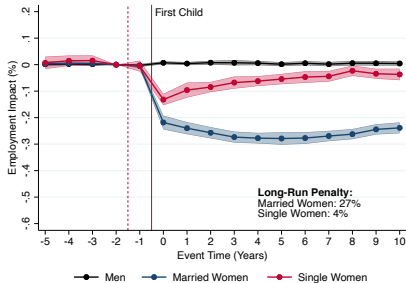
Preschool Care Expansions (Ages 3-5)



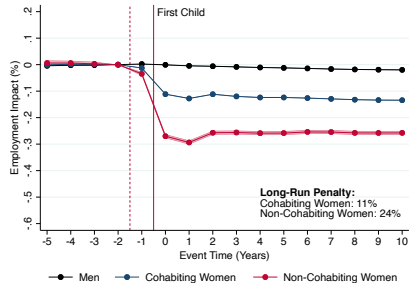
Single vs Married Women

Employment Penalties

United States

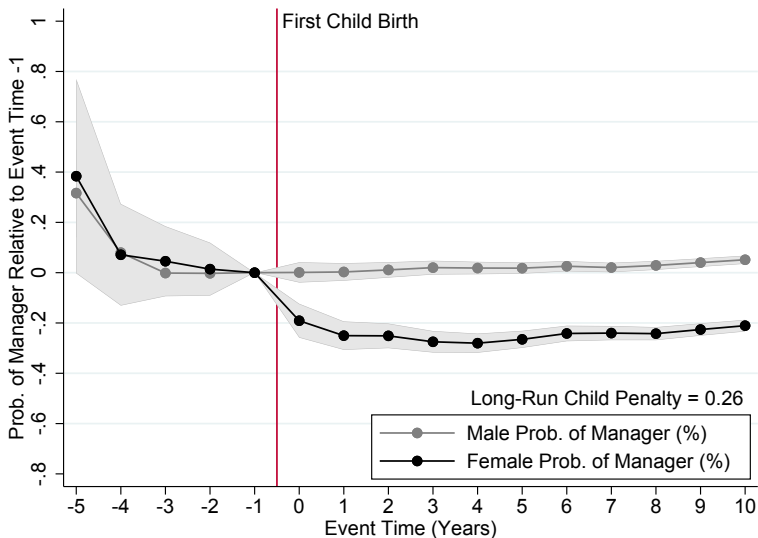


Denmark



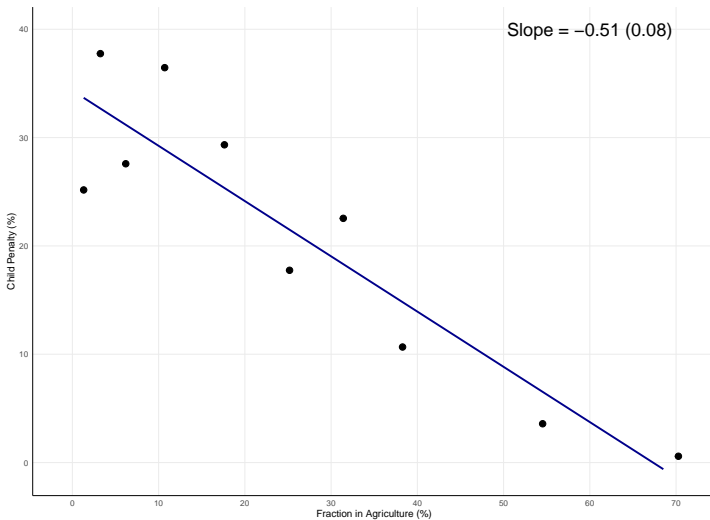
Child Penalty in Manager Promotion

Evidence from Denmark



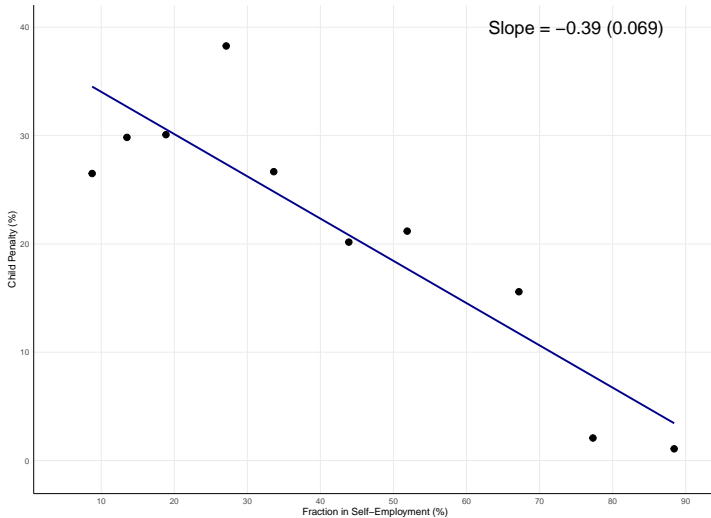
Child Penalty vs Fraction in Agriculture

Cross-Country Bin Scatter

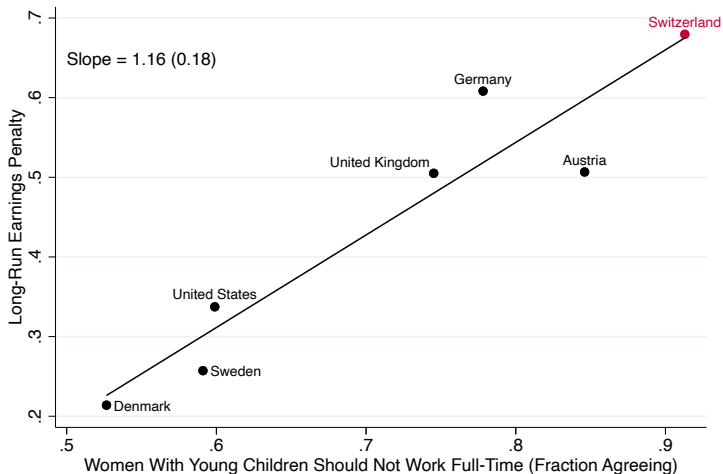


Child Penalty vs Fraction in Self-Employment

Cross-Country Bin Scatter

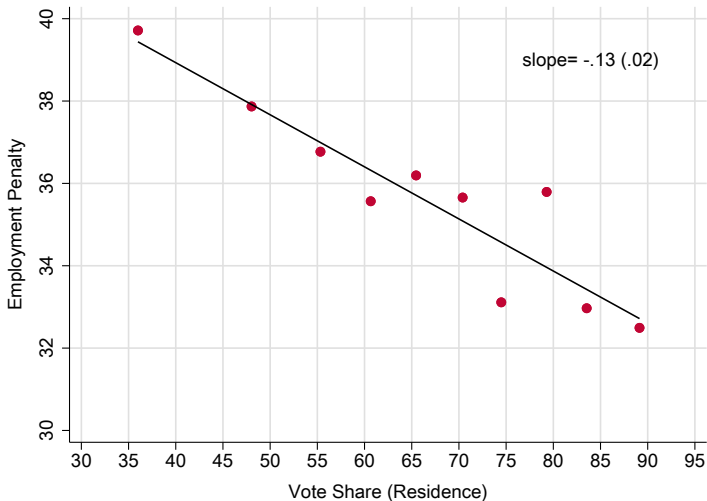


Earnings Penalties vs Social Norms



Effect of Residence Place

Holding Birth Place Constant



Effect of Birth Place

Holding Residence Place Constant

