

The Geography of Child Penalties and Gender Norms: A Pseudo-Event Study Approach

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November 2023

The Importance of Child Penalties

- ▶ Recent literature: Gender inequality is closely linked to children
 - ▶ Child penalties — causal effects of parenthood on the outcomes of women relative to men — are large and persistent
 - ▶ Eliminating child penalties \approx eliminating gender inequality
- ▶ Why are child penalties so large and persistent?
 - ▶ This amounts to asking what explains the gendered homemaker-breadwinner institution
- ▶ Answering this question is difficult
 - ▶ We need granular evidence on child penalties over space and time

Estimating Child Penalties

- ▶ Recent literature:
 - ▶ **Event studies of child birth** using panel data (Kleven, Landais & Søgaard 2019; Kleven et al. 2019)
 - ▶ **Limitation:** Requires high-quality panel data
- ▶ This paper:
 - ▶ **Pseudo-event studies of child birth** using cross-sectional data
 - ▶ **Advantage:** Feasible with widely available cross-sectional data
 - ▶ Allows for granular evidence within and across countries
 - ▶ World Atlas Project: Kleven, Landais & Leite-Mariante (2023)

Methods

Methods: Event Study Approach

Event Study Specification

Kleven, Landaï & Sogaard (2019)

- ▶ Event time t indexed relative to the year of first child birth
- ▶ Event study specification:

$$Y_{it}^g = \sum_j \alpha_j^g \cdot \text{EVENT}_{j=t} + \text{age/year dummies}$$

where α_t^g is the impact of child birth on gender g at event time t

- ▶ Percentage impacts calculated as

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

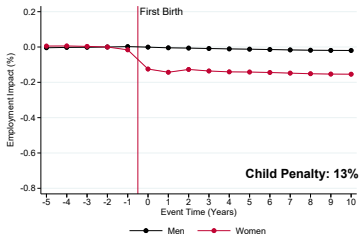
where \tilde{Y}_{it}^g is the counterfactual outcome absent children

- ▶ **Child Penalty** defined as $\text{E} [P_t^m - P_t^w \mid t \geq 0]$

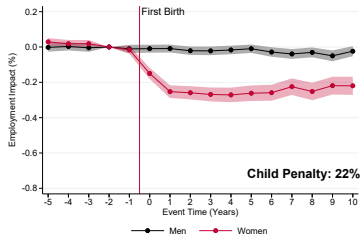
Child Penalties Across Countries

Employment

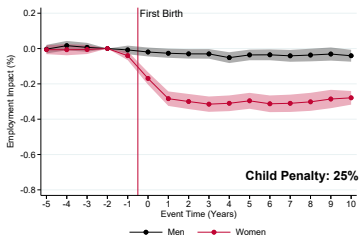
Denmark



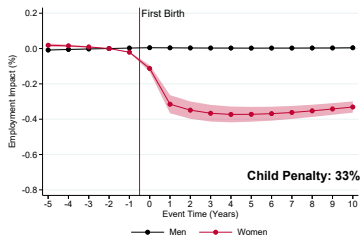
United States



United Kingdom



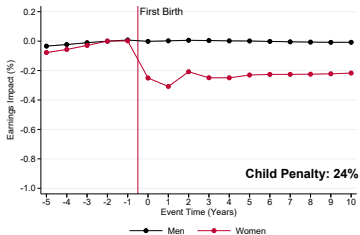
Switzerland



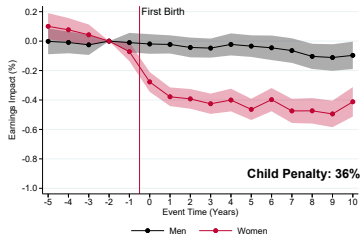
Child Penalties Across Countries

Earnings

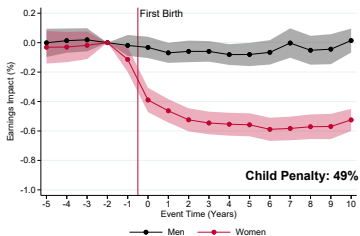
Denmark



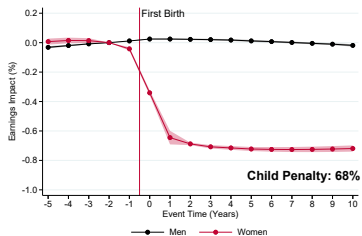
United States



United Kingdom



Switzerland



What Explains Child Penalties?

- ▶ Explanations that have little explanatory power:
 - ▶ Biology (Kleven, Landais & Søgaaard 2021)
 - ▶ Comparative advantage (Kleven, Landais & Søgaaard 2021)
 - ▶ Public policy (Kleven et al. 2021; Kleven 2021)
 - ▶ Parental leave schemes
 - ▶ Child care provision
 - ▶ Welfare programs
- ▶ Alternative explanations:
 - ▶ Labor market structure
 - ▶ Job flexibility (Goldin 2014; Goldin & Katz 2016)
 - ▶ Gender norms and culture

Methods: Pseudo-Event Study Approach

Pseudo-Event Study Approach

Data

- ▶ Use cross-sectional data and matching to create a pseudo-panel around child birth
 - ▶ Run event study specification of Kleven, Landais & Søgård (2019)
 - ▶ Validate the approach using panel data
- ▶ Cross-sectional data sources:
 - ▶ Current Population Survey (CPS): 1968-2020
 - ▶ American Community Survey (ACS): 2000-2019
- ▶ Panel data sources:
 - ▶ Panel Study of Income Dynamics (PSID): 1968-2019
 - ▶ National Longitudinal Survey of Youth (NLSY): 1979-2018

Pseudo-Event Study Approach

Method

- ▶ Key challenge: event time observed only for parents
 - ▶ For those with children, we observe event times $t \geq 0$
 - ▶ For those without children, we don't observe event times $t < 0$
⇒ Use matching to impute negative event times
- ▶ Consider a parent observed at event time 0 in year y with age a and characteristics X
- ▶ This parent is matched to
 - ▶ A non-parent observed in year $y - n$ with age $a - n$ and the same characteristics X ⇒ observation for $t = -n$
 - ▶ X includes gender, marital status, education, race, and state

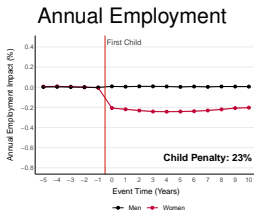
Cross-Section

Pseudo-Panel

Fertility Prediction

Validation of Approach

Pseudo-Event Studies: CPS and ACS



Actual Event Studies: PSID and NLSY



Matching Specifications

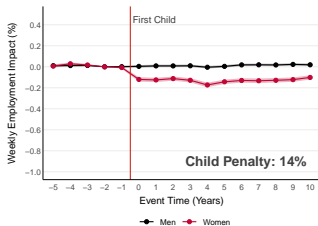
Within-Panel Validation

Child Penalties Over Space and Time

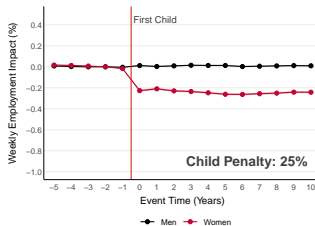
Child Penalties in Selected States

Weekly Employment

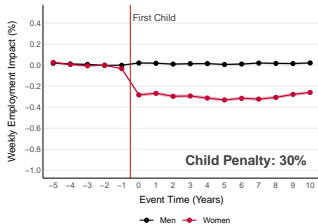
North Dakota



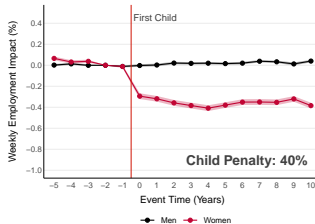
California



New Jersey

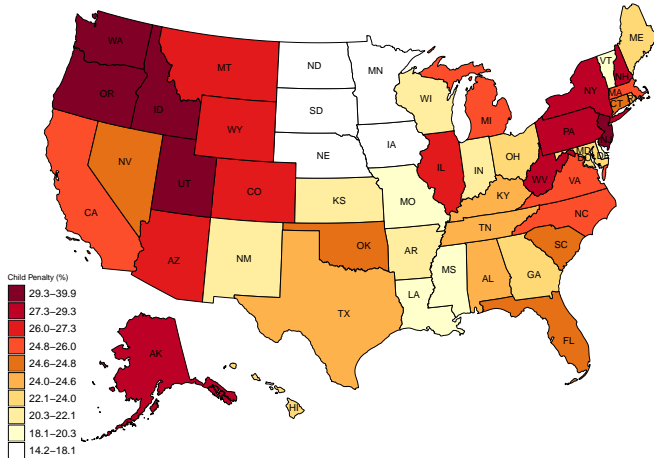


Utah



Heatmap of Child Penalties

Weekly Employment

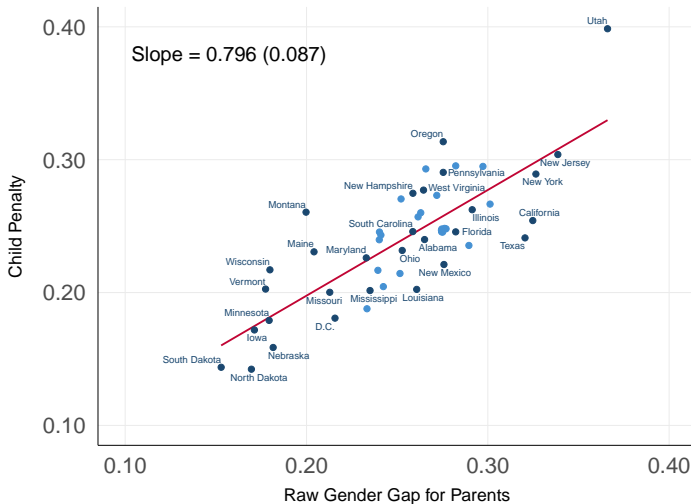


Annual Employment

Earnings

Child Penalties vs Raw Gender Gaps

Weekly Employment



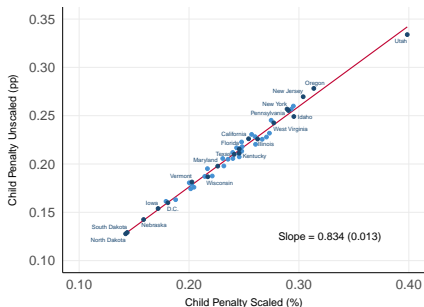
Annual Employment

Earnings

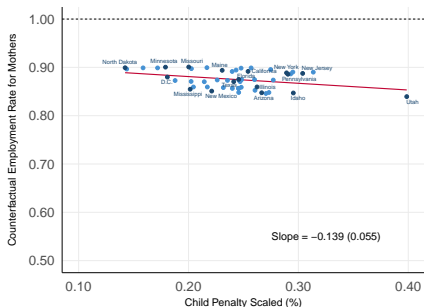
Are Child Penalties Driven by Baseline Effects?

Weekly Employment

Child Penalties Unscaled

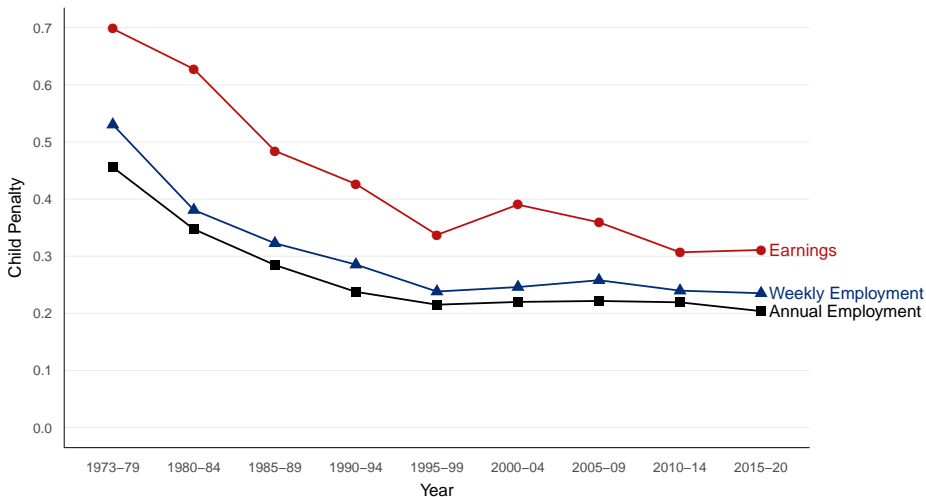


Counterfactual Employment Rates



Annual Employment

Child Penalties Over Time



Event Studies

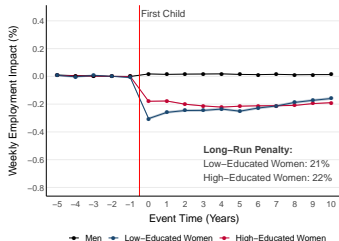
Fraction Explained

Child Penalties Across Demographics

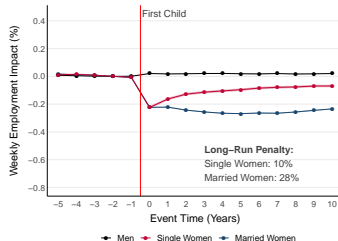
Child Penalties Across Demographics

Weekly Employment

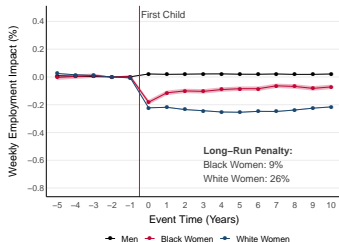
Education



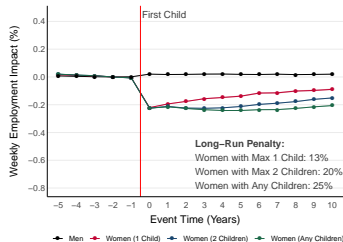
Marital Status



Race



Fertility



Child Penalties and Gender Norms

Child Penalties and Gender Norms

Overview

1. Child Penalties vs Elicited Gender Norms [Results](#)
2. Epidemiological Study of US Movers [Results](#)
 - ▶ Child penalty for movers vs stayers by state of birth
3. Epidemiological Study of Foreign Immigrants [Results](#)
 - ▶ Child penalty for immigrants vs child penalty in country of birth
4. Cultural Assimilation [Results](#)
 - ▶ First-generation vs later-generation immigrants

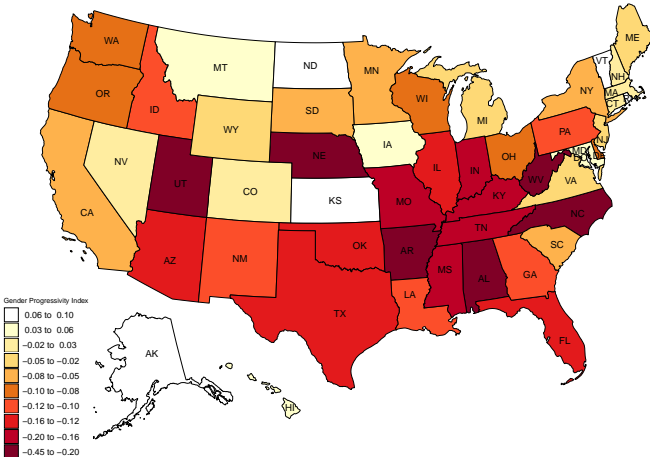
[Conclusion](#)

Child Penalties vs Elicited Gender Norms

Measuring Gender Norms

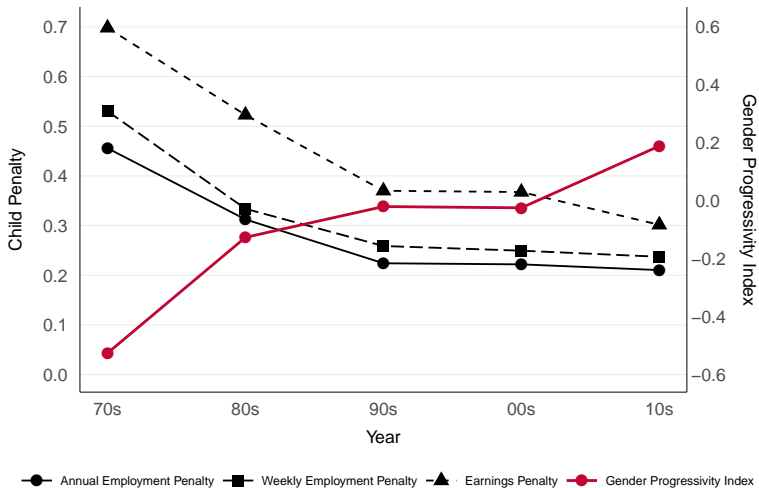
- ▶ Use General Social Survey (GSS) from 1972-2018
- ▶ Use three questions available in all decades:
 - ▶ Do you strongly agree, agree, disagree, or strongly disagree with:
 - ▶ *It is much better for everyone involved if the man is the achiever outside the home and the woman takes care of the home and family*
 - ▶ *A working mother can establish just as warm and secure a relationship with her children as a mother who does not work*
 - ▶ *A preschool child is likely to suffer if his or her mother works*
- ▶ Create **Gender Progressivity Index** based on the average of (standardized) responses to these three questions

Heatmap of Gender Progressivity



Child Penalties vs Gender Progressivity

Time Variation

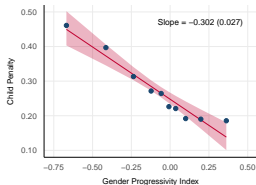


Child Penalties vs Gender Progressivity

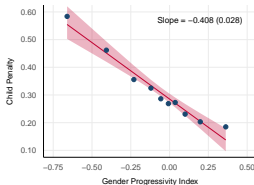
State and Time Variation

State Fixed Effects

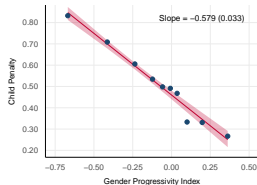
Annual Employment



Weekly Employment

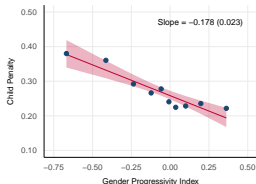


Earnings

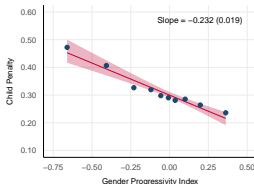


State Fixed Effects & Demographic Controls

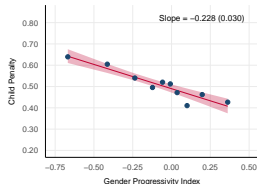
Annual Employment



Weekly Employment



Earnings



Epidemiological Study: US-Born Movers

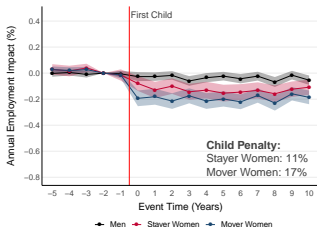
Epidemiological Study of US Movers

- ▶ Use information on state of birth and state of residence in ACS data
- ▶ Define movers and stayers:
 - ▶ **Movers:** US-born individuals who reside in a different state than where they were born
 - ▶ **Stayers:** US-born individuals who reside in the same state as where they were born
- ▶ Study relationship between the child penalty for movers and the child penalty for stayers in their state of birth
- ▶ This builds on the epidemiological approach to studying culture (typically focusing on immigrants)

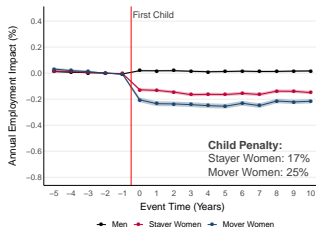
Child Penalties for Movers vs Stayers by State of Birth

Annual Employment: Selected States

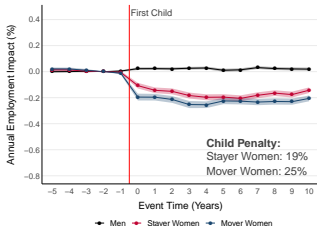
North Dakota



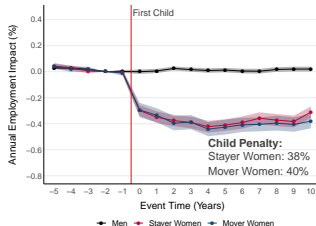
California



New Jersey

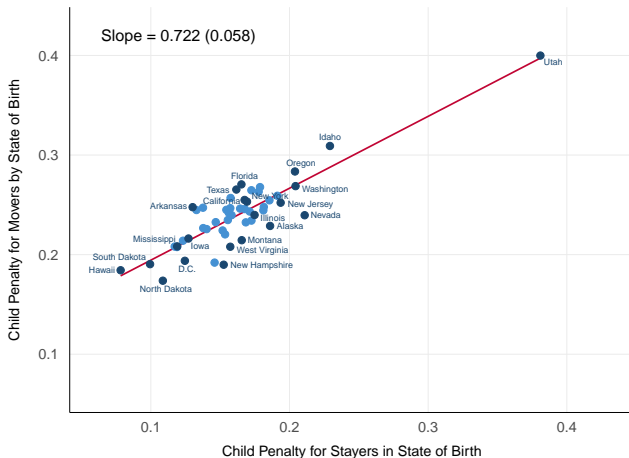


Utah



Child Penalties for Movers vs Stayers by State of Birth

Annual Employment: All States



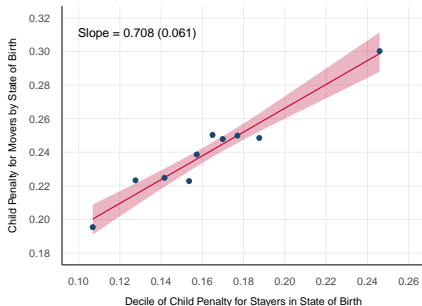
Weekly Employment

Selection of Movers

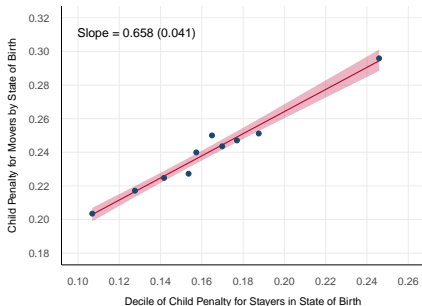
Child Penalties for Movers vs Stayers by State of Birth

Annual Employment: All States

Binscatter: No Controls



Binscatter: State-of-Residence Controls



[Weekly Employment](#)

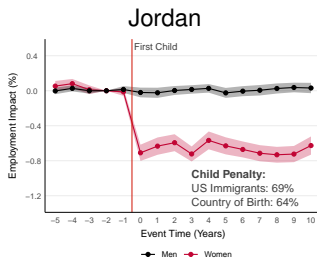
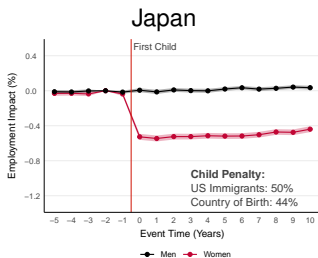
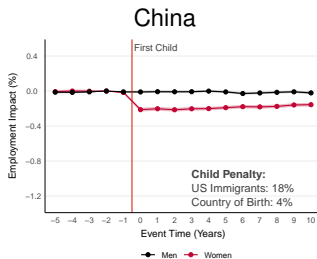
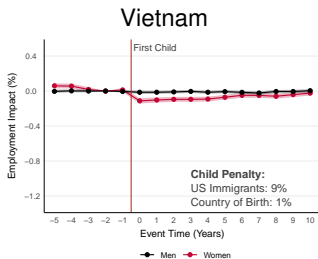
[Overview](#)

[Conclusion](#)

Epidemiological Study: Foreign-Born Immigrants

Child Penalties for Immigrants by Country of Birth

Asian Immigrants



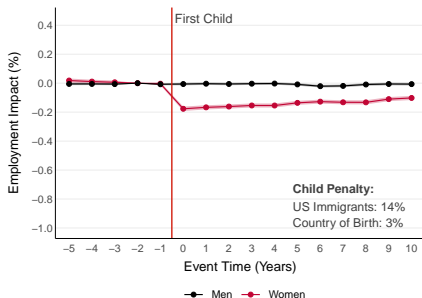
Latin American Immigrants

African Immigrants

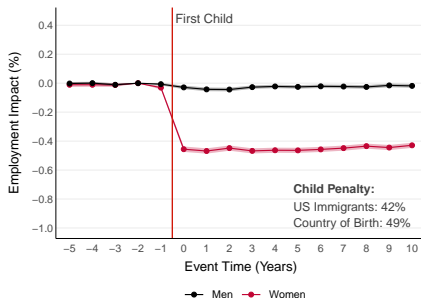
Child Penalties for Immigrants by Country of Birth

Bottom vs Top Decile of Birth-Country Penalty

Bottom Decile

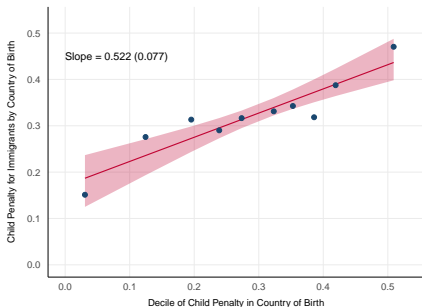


Top Decile

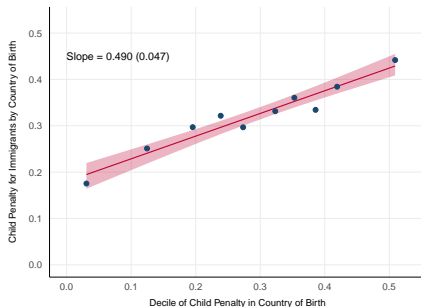


Immigrant Penalties vs Birth-Country Penalties

Binscatter: No Controls



Binscatter: Demographic Controls



Raw Scatters

Selection of Immigrants

Education

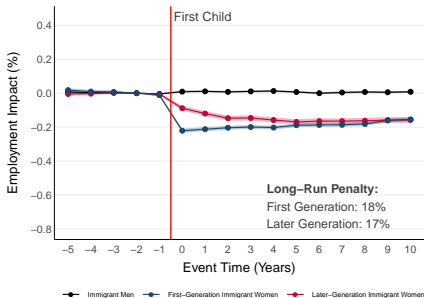
Overview

Conclusion

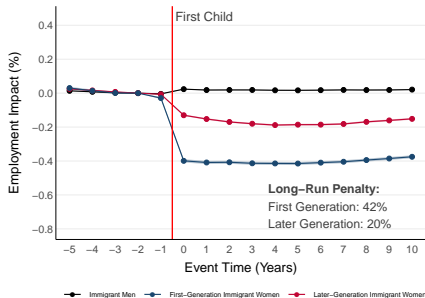
Cultural Assimilation

First-Generation vs Later-Generation Penalties by Origin-Country Penalties

Bottom Quartile



Top Quartile



Conclusion

Conclusion

- ▶ Child penalties are large and persistent
 - ▶ Account for most of the remaining gender inequality in developed countries
- ▶ Child penalties vary greatly in magnitude
 - ▶ Variation across time, space, and cultural groups
 - ▶ This paper documents potentially large effects of norms/culture using a variety of approaches
- ▶ Child penalties can be estimated using a simple cross-sectional approach
 - ▶ Applicability of the approach is wide-ranging due to the minimal data requirements
 - ▶ Allows for building a global child penalty atlas (Kleven, Landais & Leite-Mariante 2023)

Appendix

Descriptive Statistics in the Cross-Section

Parents Are Positively Selected

	Men			Women		
	Child	No Child	Difference	Child	No Child	Difference
Annual Employment Rate	0.89	0.79	0.10	0.71	0.80	-0.09
Weekly Employment Rate	0.91	0.75	0.15	0.68	0.75	-0.07
Earnings	53,254	28,650	24,604	23,796	24,943	-1,147
Fraction High School or Below	0.43	0.44	-0.01	0.41	0.32	0.09
Fraction College	0.30	0.25	0.05	0.28	0.34	-0.06
Fraction Married	0.87	0.25	0.62	0.72	0.34	0.39
Fraction Black	0.07	0.11	-0.04	0.11	0.11	0.00
Fraction White	0.72	0.67	0.04	0.67	0.70	-0.03
Fraction Hispanic	0.14	0.13	0.01	0.15	0.11	0.04
Age	38.63	32.55	6.08	37.28	32.90	4.38
Cohort	1967.00	1974.43	-7.43	1968.44	1973.92	-5.48
Number of Observations	9,901,305	11,468,329		13,247,471	9,085,312	

* Includes individuals aged 20-50 pooling CPS (1968-2020) and ACS (2000-2019) data.

[Back](#)

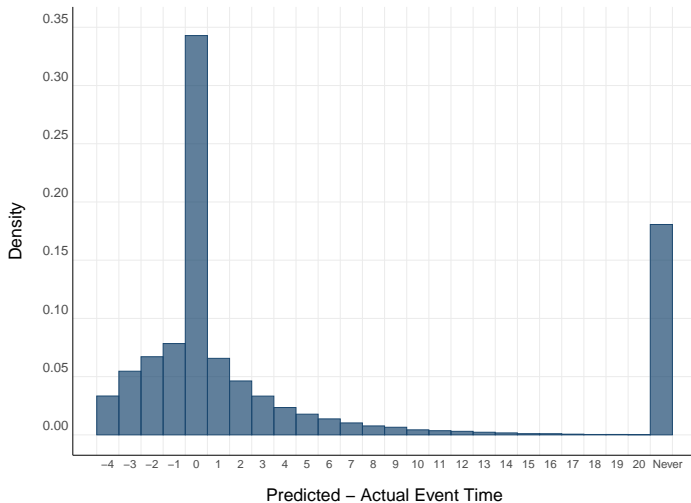
Descriptive Statistics in the Pseudo-Panel

No Selection on Observables

	Matched Men			Matched Women		
	$t = 0$	$t = -1$	Difference	$t = 0$	$t = -1$	Difference
Annual Employment Rate	0.92	0.91	0.01	0.72	0.87	-0.15
Weekly Employment Rate	0.93	0.90	0.03	0.69	0.83	-0.14
Earnings	55,136	49,102	6,034	29,846	36,820	-6,974
Fraction High School or Below	0.26	0.26	0.00	0.17	0.17	0.00
Fraction College	0.47	0.47	0.00	0.57	0.57	0.00
Fraction Married	0.88	0.88	0.00	0.85	0.85	0.00
Fraction Black	0.04	0.04	0.00	0.05	0.05	0.00
Fraction White	0.80	0.80	0.00	0.77	0.77	0.00
Fraction Hispanic	0.10	0.10	0.00	0.09	0.09	0.00
Age at First Birth	31.79	31.79	0.00	30.60	30.60	0.00
Age	31.79	30.79	1.00	30.60	29.60	1.00
Cohort	1974.56	1974.56	0.00	1976.21	1976.21	0.00
Number of Observations	246,763	246,763		244,376	244,376	

Quality of Fertility Prediction

Predicted vs Actual Event Times Among Childless People

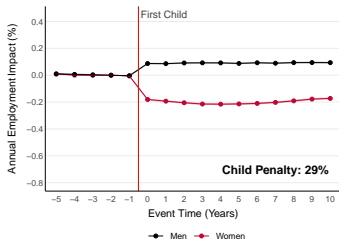


[Back](#)

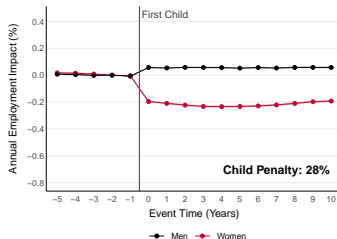
Matching Specifications

Annual Employment

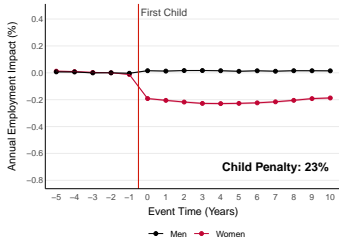
Match on Year, Age, Gender



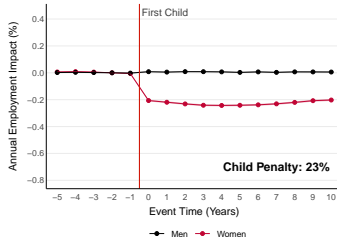
Add Education



Add Marital Status



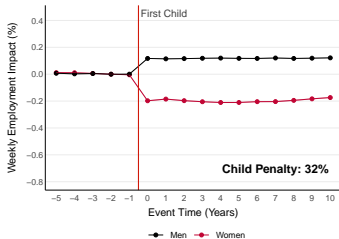
Add Race and State



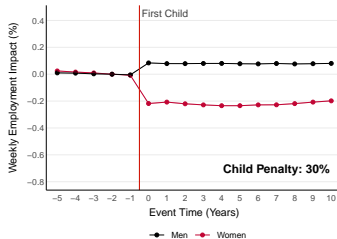
Matching Specifications

Weekly Employment

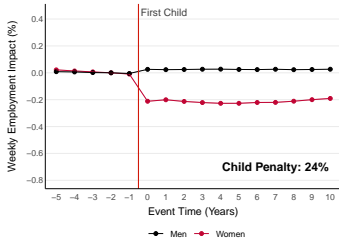
Match on Year, Age, Gender



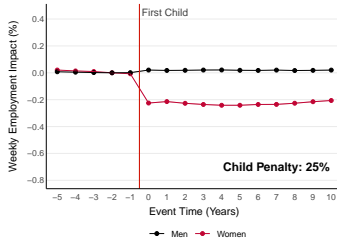
Add Education



Add Marital Status



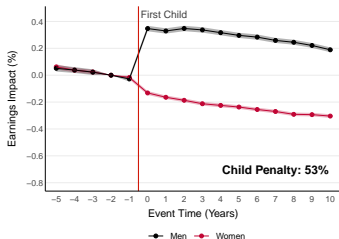
Add Race and State



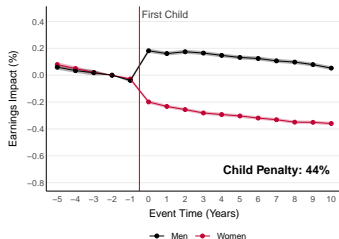
Matching Specifications

Earnings

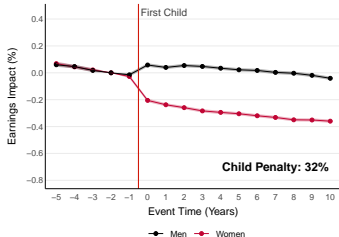
Match on Year, Age, Gender



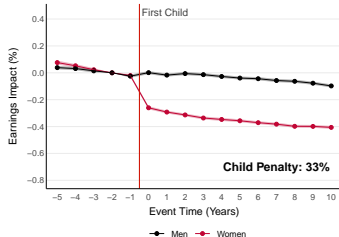
Add Education



Add Marital Status

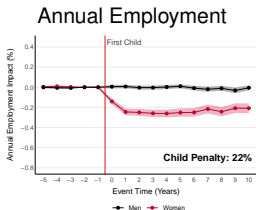


Add Race and State

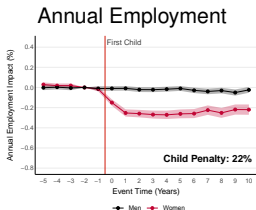


Within-Panel Validation of Approach

Pseudo-Event Studies: PSID and NLSY



Actual Event Studies: PSID and NLSY

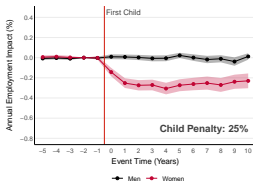


Within-Panel Validation in Subsamples

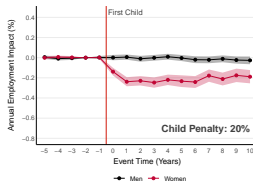
Annual Employment by Census Region

Pseudo-Event Studies: PSID and NLSY

Census Regions West and Midwest

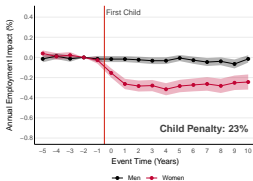


Census Regions South and Northeast

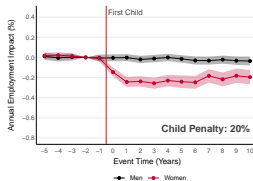


Actual Event Studies: PSID and NLSY

Census Regions West and Midwest



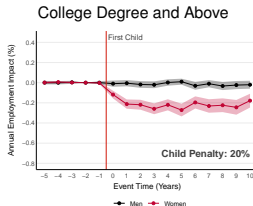
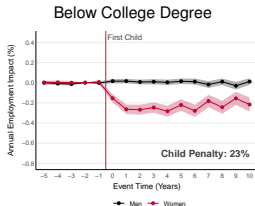
Census Regions South and Northeast



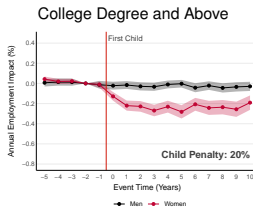
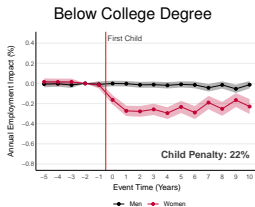
Within-Panel Validation in Subsamples

Annual Employment by Education

Pseudo-Event Studies: PSID and NLSY



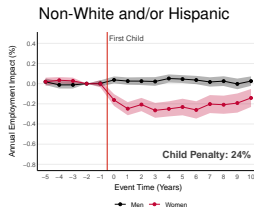
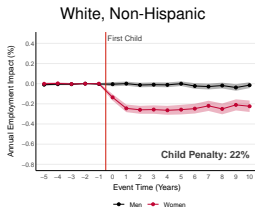
Actual Event Studies: PSID and NLSY



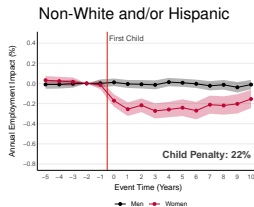
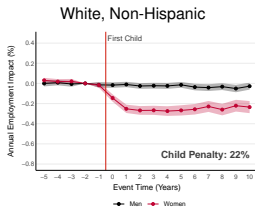
Within-Panel Validation in Subsamples

Annual Employment by Race

Pseudo-Event Studies: PSID and NLSY



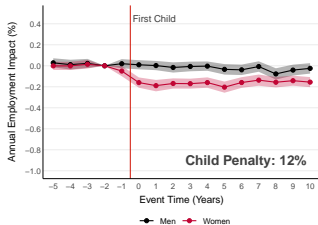
Actual Event Studies: PSID and NLSY



Child Penalties in Selected States

Annual Employment

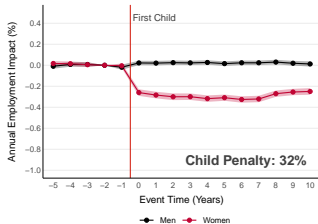
North Dakota



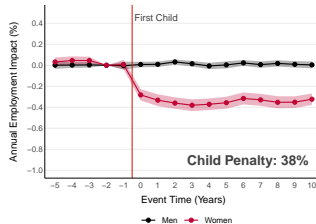
California



New Jersey



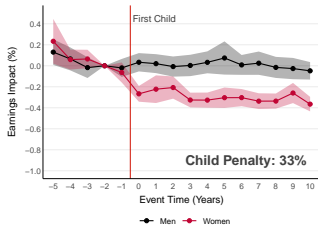
Utah



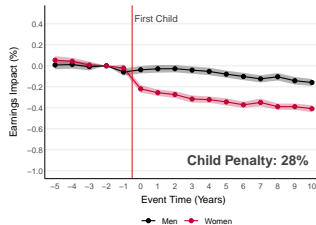
Child Penalties in Selected States

Earnings

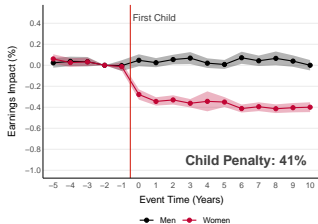
North Dakota



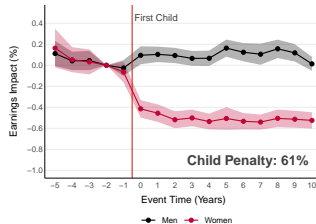
California



New Jersey

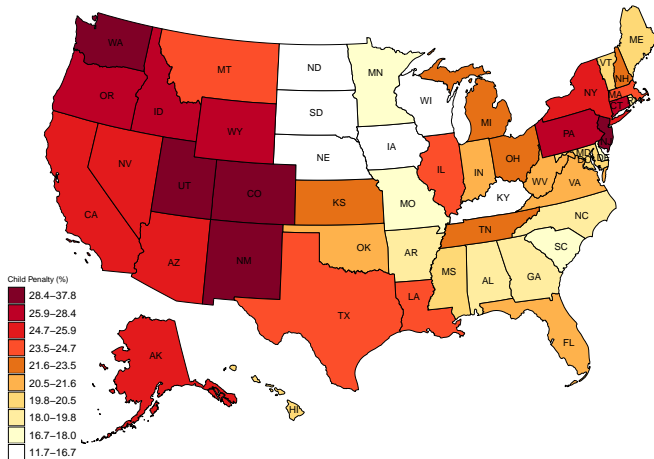


Utah



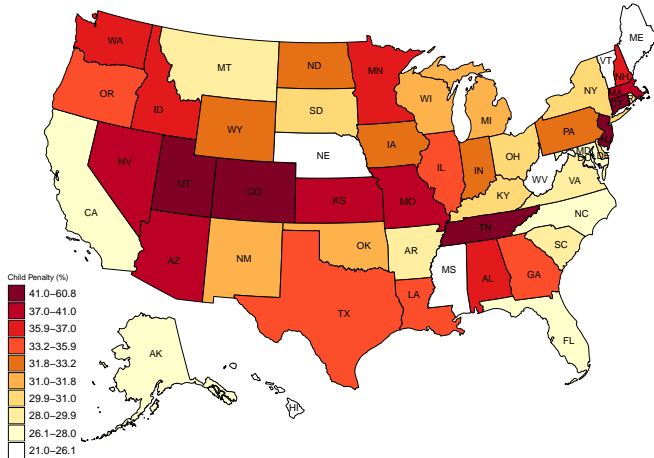
Heatmap of Child Penalties

Annual Employment



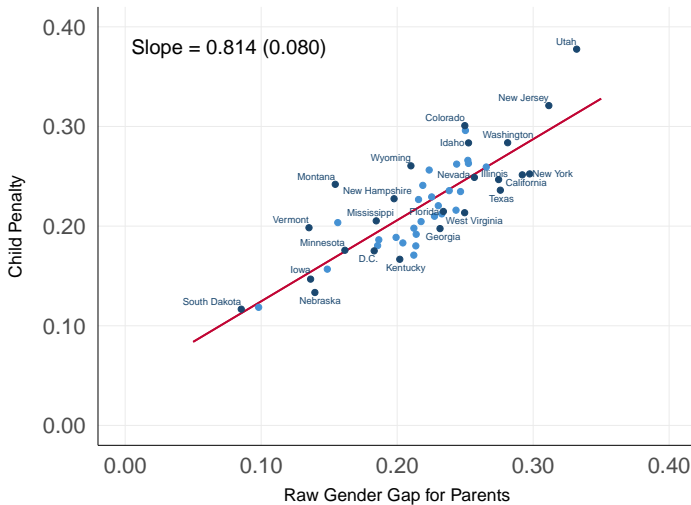
Heatmap of Child Penalties

Earnings



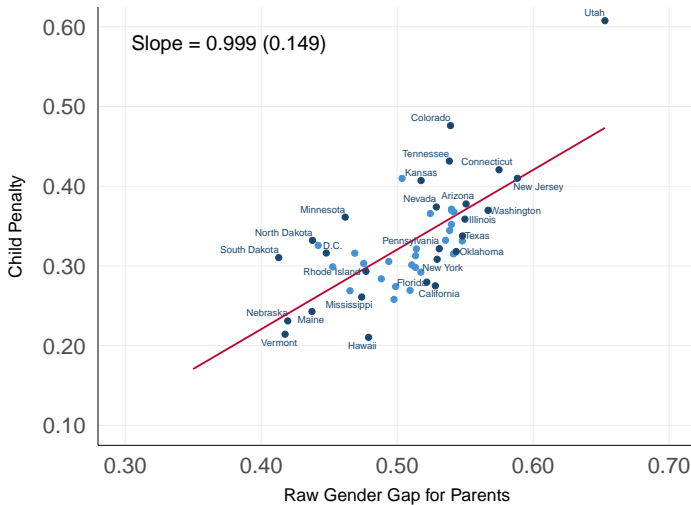
Child Penalties vs Raw Gender Gaps

Annual Employment



Child Penalties vs Raw Gender Gaps

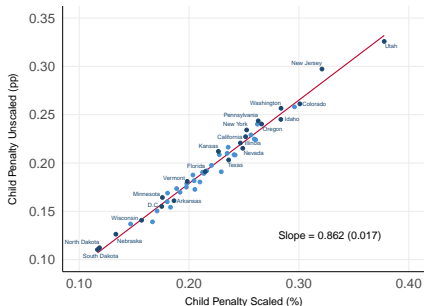
Earnings



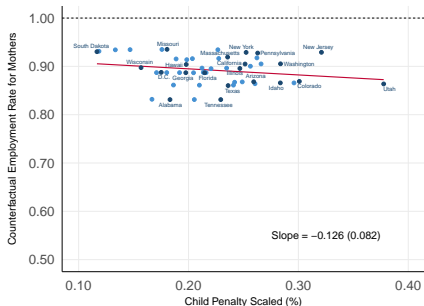
Are Child Penalties Driven by Baseline Effects?

Annual Employment

Child Penalties Unscaled



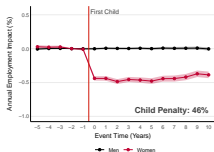
Counterfactual Employment Rates



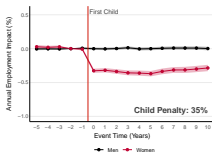
Child Penalties Over Time

Annual Employment

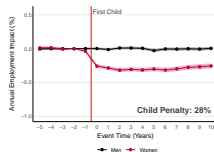
1973-79



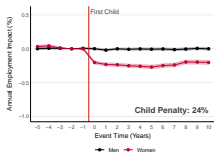
1980-84



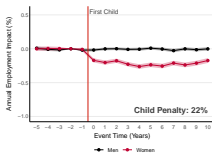
1985-89



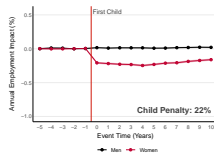
1990-94



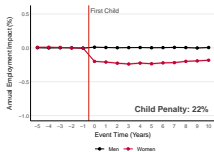
1995-99



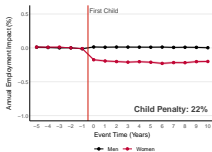
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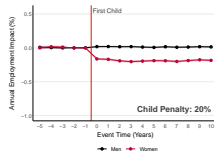
2005-09



2010-14



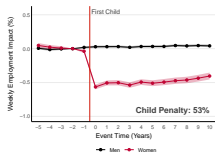
2015-20



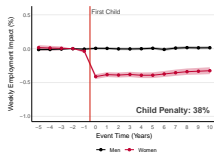
Child Penalties Over Time

Weekly Employment

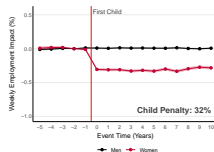
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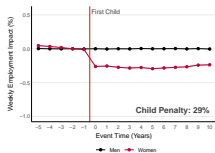
1980-84



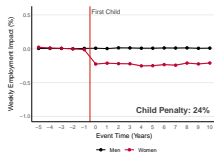
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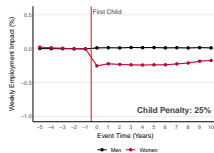
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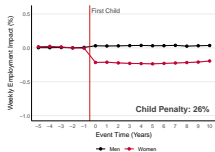
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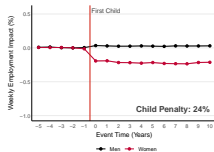
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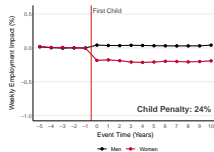
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2010-14



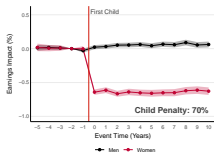
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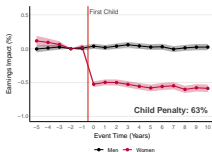
Child Penalties Over Time

Earnings

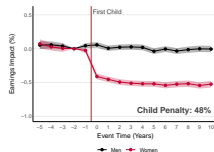
1973-79



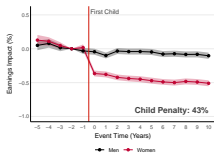
1980-84



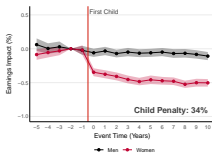
1985-89



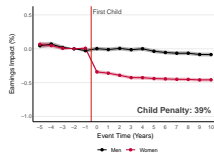
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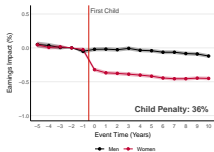
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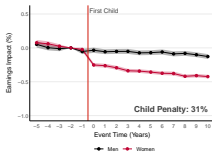
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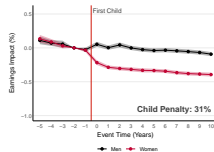
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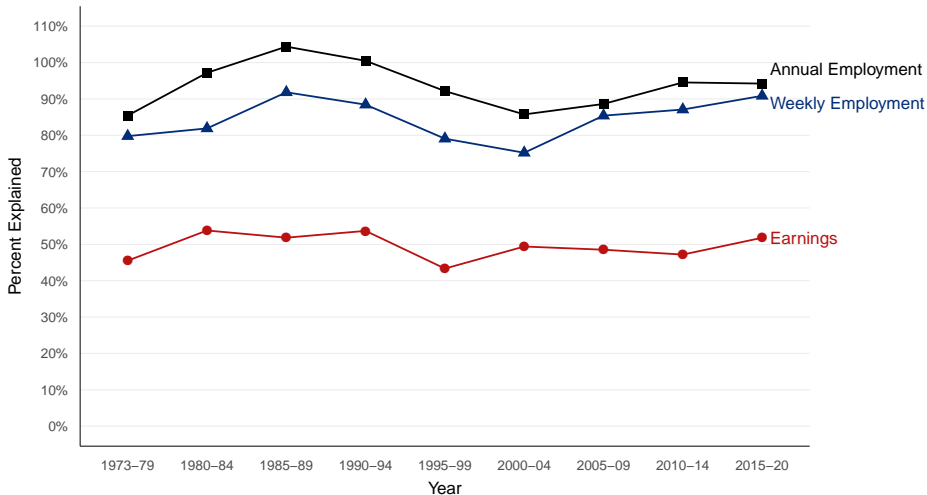
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2015-20



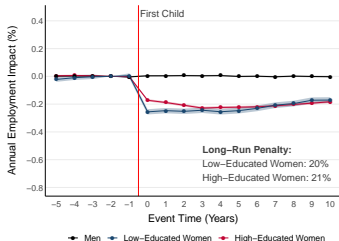
Fraction of Raw Gender Gaps Explained by Child Penalties



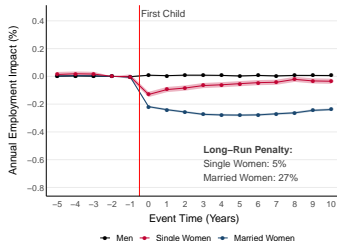
Child Penalties Across Demographics

Annual Employment

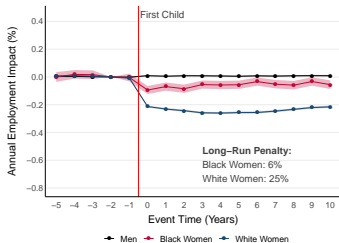
Education



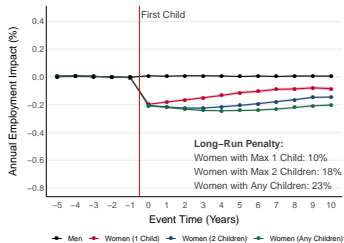
Marital Status



Race



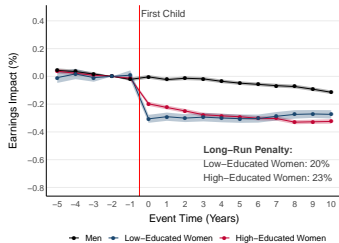
Fertility



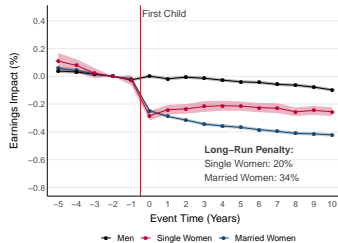
Child Penalties Across Demographics

Earnings

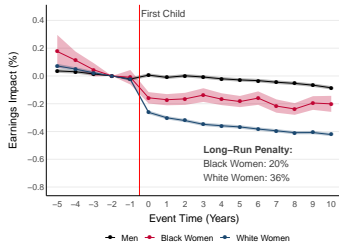
Education



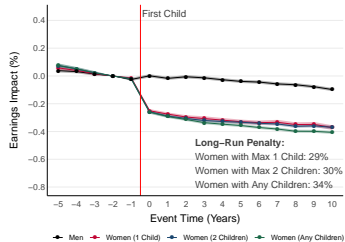
Marital Status



Race



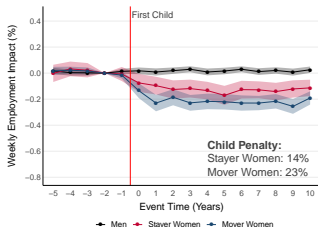
Fertility



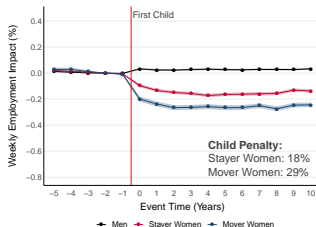
Child Penalties for Movers vs Stayers by State of Birth

Weekly Employment: Selected States

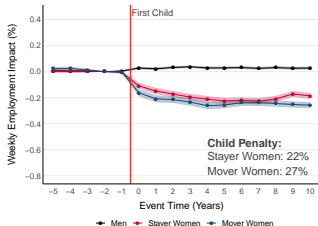
North Dakota



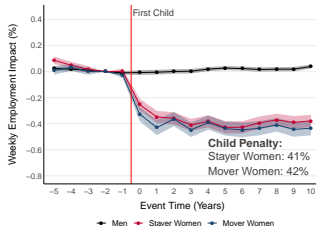
California



New Jersey

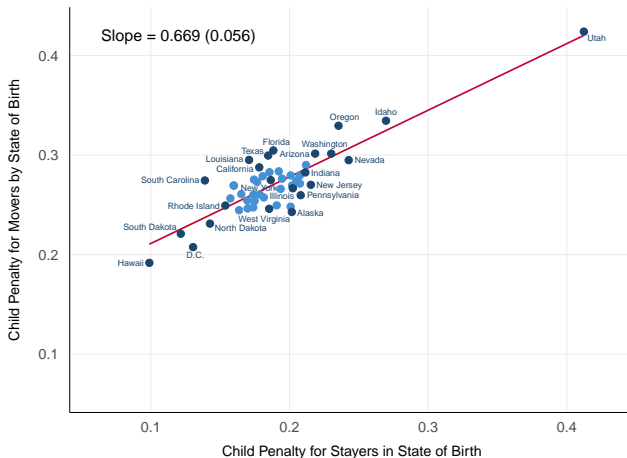


Utah



Child Penalties for Movers vs Stayers by State of Birth

Weekly Employment: All States



Selection of US Movers by State of Birth

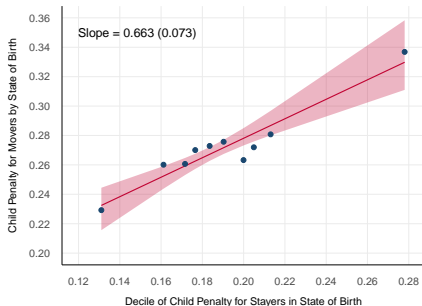
US Movers by State of Birth			
	High-Penalty States	Low-Penalty States	Difference
<i>Demographic Characteristics of Mothers:</i>			
Fraction Living in High-Penalty States	0.25	0.18	0.07
Fraction High School or Below	0.12	0.11	0.01
Fraction College	0.61	0.63	-0.02
Fraction Married	0.84	0.84	0.00
Fraction Black	0.04	0.09	-0.05
Fraction White	0.91	0.86	0.05
Fertility	1.78	1.76	0.02
Age at First Birth	31.39	31.33	0.06
Age	37.59	37.60	0.00
Cohort	1973.20	1972.98	0.22
Number of Observations	95,437	77,971	

[Back](#)

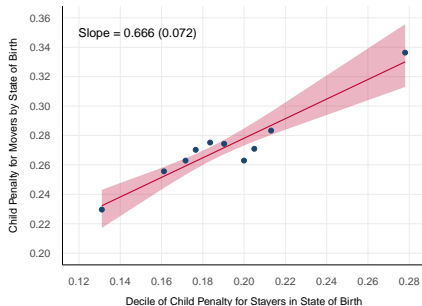
Child Penalties for Movers vs Stayers by State of Birth

Weekly Employment: All States

Binscatter: No Controls



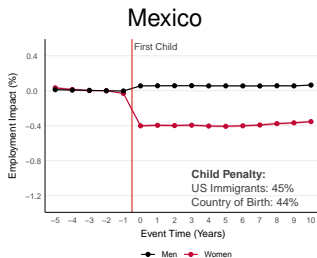
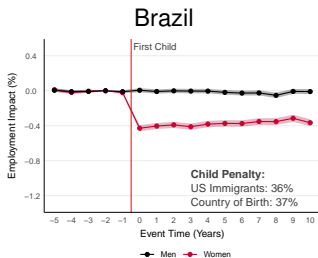
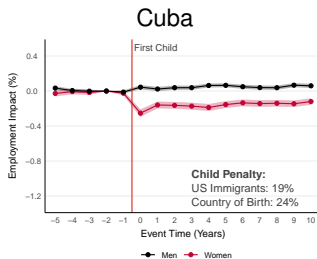
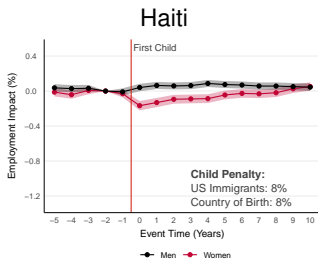
Binscatter: State-of-Residence Controls



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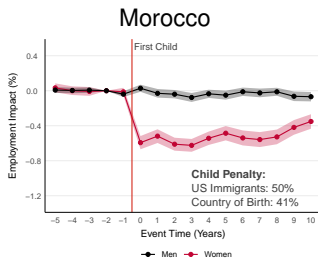
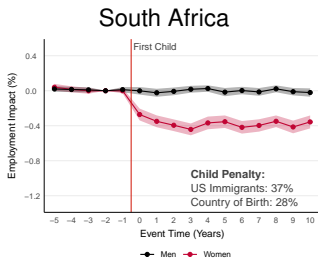
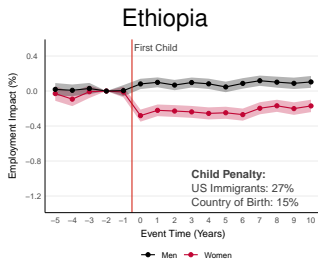
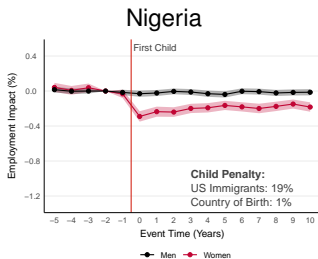
Child Penalties for Immigrants by Country of Birth

Latin American Immigrants



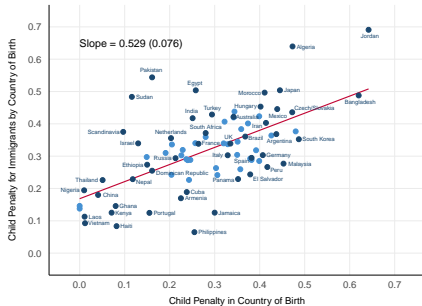
Child Penalties for Immigrants by Country of Birth

African Immigrants

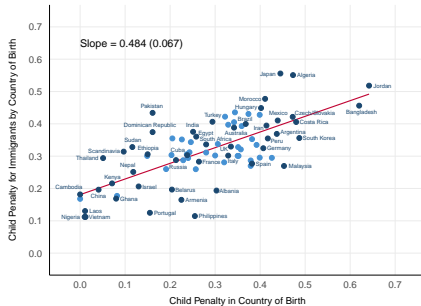


Immigrant Penalties vs Birth-Country Penalties

Raw Scatter: No Controls



Raw Scatter: Demographic Controls



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Selection of Foreign Immigrants by Country of Birth

US Immigrants by Country of Birth			
	High-Penalty Countries	Low-Penalty Countries	Difference
<i>Demographic Characteristics of Mothers:</i>			
Fraction Living in High-Penalty States	0.19	0.20	-0.01
Fraction High School or Below	0.47	0.30	0.17
Fraction College	0.34	0.49	-0.16
Fraction Married	0.82	0.86	-0.04
Fraction Black	0.02	0.17	-0.15
Fraction White	0.66	0.15	0.51
Fertility	1.72	1.67	0.06
Age at First Birth	30.65	31.18	-0.53
Age	36.53	36.91	-0.38
Cohort	1972.83	1973.14	-0.31
Number of Observations	191,017	114,672	

Child Penalties for Immigrants by Education

