

Graduate Labor Economics

Children and Gender Inequality

The Child Penalty

ScPo, Spring 2018

Based on Kleven et al. (2015)

February 6, 2018

Table of contents

Introduction

Institutions and Data

Impact of Children

Estimating the Impacts of Children

Identification

Intergenerational Transmission of Child Penalties

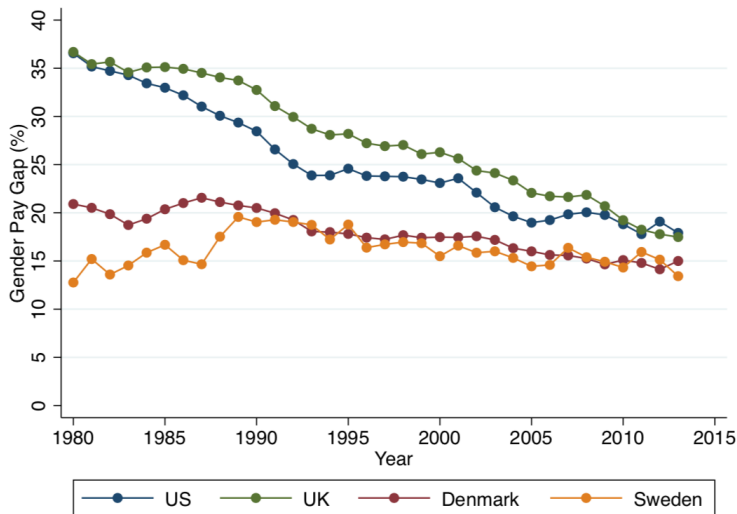
Intro

- We heard that there is still a persistent gender wage gap.
- Early literature focused on the role of discrimination (now largely gone).
- Effect of *children* on female careers remains negative and large.
- This paper is about Denmark, but results seem to be generalizable.

Convergence in Pay Gap

A: Convergence of the Gender Pay Gap Across Countries

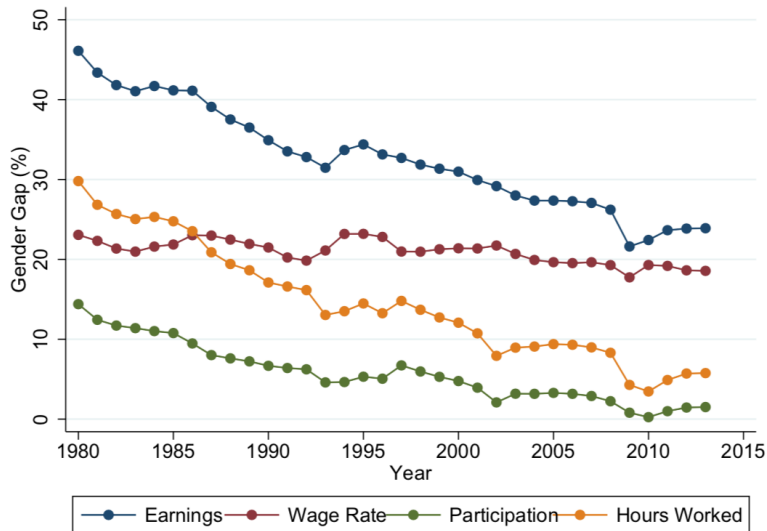
Median Earnings for Full-Time Workers



Convergence in other dimensions

B: Evolution of Gender Gaps in Denmark

Means for All Workers



Event Study Approach

- Core results rely on **within person** variation.
- How does person i change at date t ?
- Usually the literature employs cross-sectional variation, trying to explain residual wage gap after human capital is controlled for.
- Requires extremely detailed data. **Denmark.**

1 Gender inequality in the labor market:

- human capital
- occupation/discrimination, parenthood

2 Children and family labor supply

- Potential endogeneity of children, IVs: twin births and sibling sex mix.

Literature

a lot.

Our paper contributes primarily to two literatures. First and foremost, we contribute to the enormous literature on gender inequality in the labor market as reviewed by for example [Altonji & Blank \(1999\)](#), [Bertrand \(2011\)](#), [Blau & Kahn \(2016\)](#) and [Olivetti & Petrongolo \(2016\)](#). Much of this literature has focused on the role of human capital, occupation and discrimination in explaining gender gaps, but there is also a sizeable amount of work on the role of parenthood. This includes papers by [Waldfogel \(1998\)](#), [Lundberg & Rose \(2000\)](#), [Sigle-Rushton & Waldfogel \(2007a,b\)](#), [Correll et al. \(2007\)](#), [Paull \(2008\)](#), [Bertrand et al. \(2010\)](#), [Wilde et al. \(2010\)](#), [Fernandez-Kranz et al. \(2013\)](#), [Fitzenberger et al. \(2013\)](#), [Goldin \(2014\)](#), [Adda et al. \(2015\)](#), [Angelov et al. \(2016\)](#), and [Goldin & Katz \(2016\)](#). Our paper is most closely related to the case study of MBA graduates from Chicago Booth School of Business by [Bertrand et al. \(2010\)](#), and to the paper by [Angelov et al. \(2016\)](#) who estimate

Expected costs of Children on Labor Market Outcomes

- 1 Pre-child effect: Women may invest less in education and/or select family friendly career paths
- 2 Post-child effect: Women change labor market behavior as a response to being mother

This paper is designed to study only the post-child effect.

- anticipatori effects might have played a role in early periods
- just looking at graduation rates nowadays seems to say that this doesn't matter so much any more.
- $\Rightarrow$ **women** pay the cost of children once they are born. (**not** men.)

Institutions in Denmark

- 80% female labor force participation.
- job-protected parental leave and public provision of child care.
- Perception of what *women with children are supposed to do* are surprisingly uniform across countries.
- In Denmark there is universal public childcare at highly subsidized rates from 6 months after birth. Until then there is job-protected parental leave.
 - 1 18 weeks paid maternity leave
 - 2 32 of parental leave to be split between parents.

Data

- **Full population** of Denmark 1980-2013.
- Can even go back to 1964 to get parents of 1980 cohort.
- Measure of hours worked: Pension contributions. (covers self-employed who contribute. *and the ones who don't?*)

Introduction

Institutions and Data

Impact of Children

Estimating the Impacts of Children

Identification

Intergenerational Transmission of Child Penalties

Event Studies

- Growing in popularity.
- Exploits within unit (person/firm) variation around some date t .
- Identifying assumptions are similar to RD Design: at a threshold (t) **treatment** switches discretely to **on** - other factors evolve smoothly.
- Most of the times, a graphical analysis can be employed.
- Card et al. (2013) is another example that we will encounter.

Impact of Children

- Children are not randomly allocated to people, so we could regress children on hours worked.
- Previous literature addresses this with IV: twin births (planned only for one!), or sex-mix (had 2 boys, now you probably want a girl vs had boy and girl, you had enough).
- can obviously only identify impact of 2nd or 3rd child!
- but we think that the **1st child** is the most important one.

Setup

- call $t = 0$ the date at which each parent has first child.
- consider years $t = -5, \dots, 10$.
- For outcome Y_{ist}^g we have

$$Y_{ist}^g = \sum_{j \neq -1} \alpha_j^g \mathbf{1}[j = t] + \sum_k \beta_k^g \mathbf{1}[k = \text{age}_{is}] + \sum_y \gamma_y^g \mathbf{1}[y = s] + \nu_{ist}^g$$

- Age and year dummies control non-parametrically for lifecycle and business cycle effects.
- Discuss how they can identify all three sets of dummies!

Child Penalty

- Let $\tilde{Y}_{ist}^g$ be counterfactual outcome absent children
- **Child Penalty** at date t is the percentage difference in male/female $\hat{\alpha}$ relative to *woman without children*:

$$P_t = \frac{\hat{\alpha}_t^m - \hat{\alpha}_t^w}{E[\tilde{Y}_{ist}^w | t]}$$

Introduction

Institutions and Data

Impact of Children

Estimating the Impacts of Children

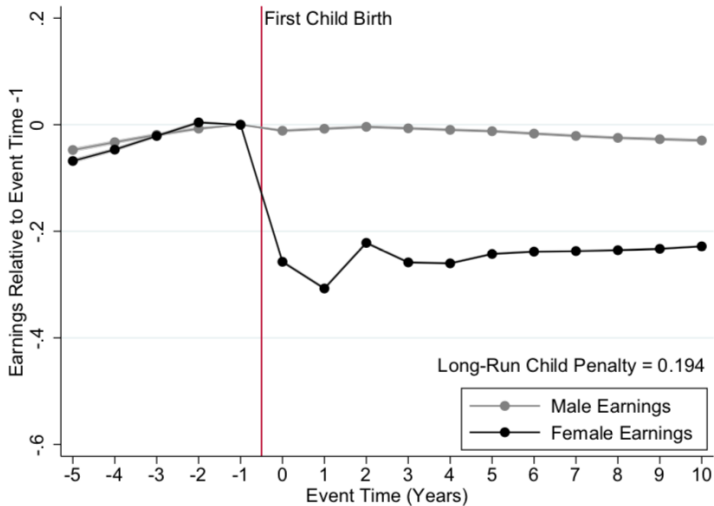
Identification

Intergenerational Transmission of Child Penalties

Results: Child Penalty

Figure 3

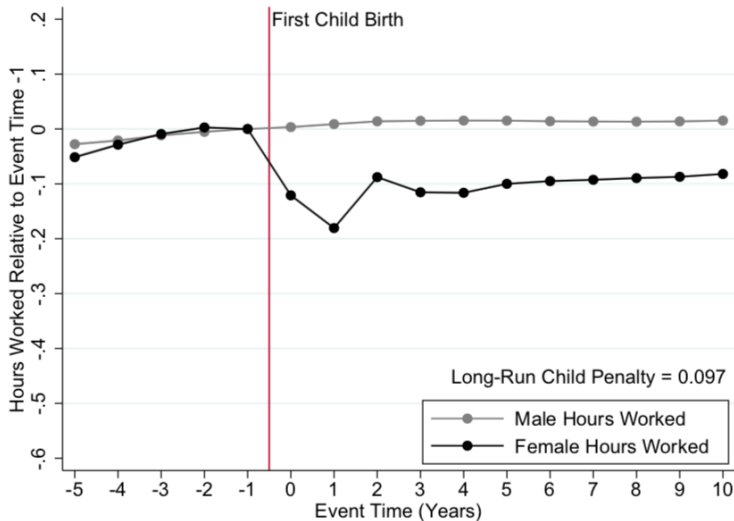
A: Earnings



Results: Child Penalty

Figure 3

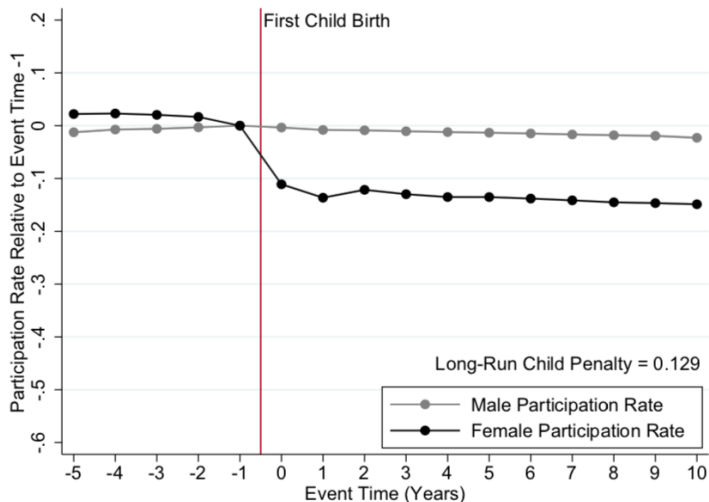
B: Hours Worked



Results: Child Penalty

Figure 3

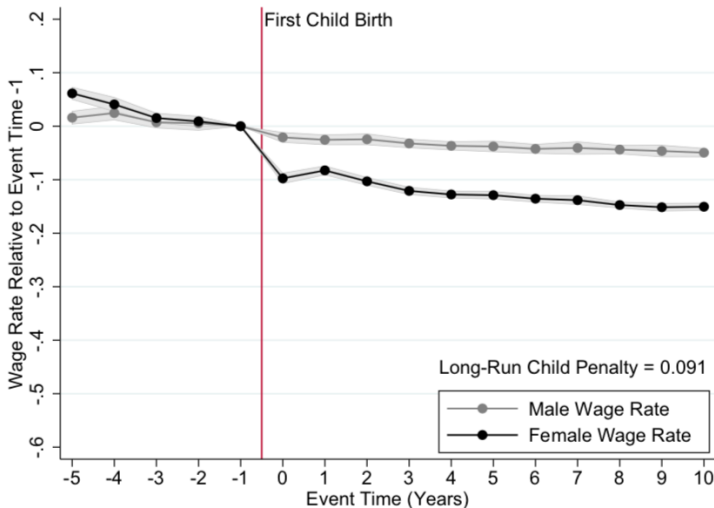
C: Participation Rates



Results: Child Penalty

Figure 3

D: Wage Rates



Discussion 1

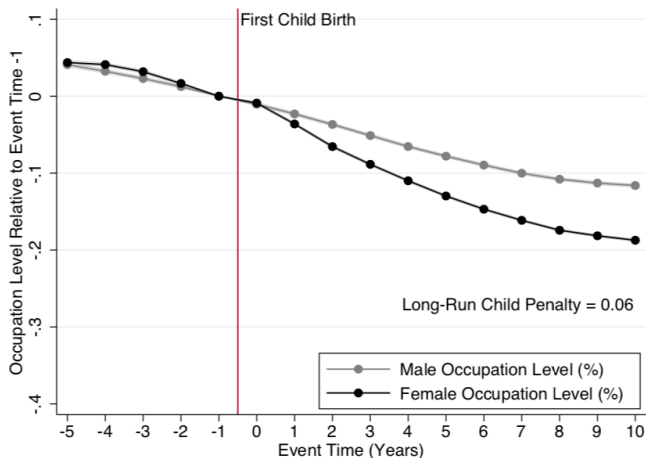
- The results are robust to a 20 year horizon
- the curves don't converge.
- Now what's the impact of career choices? Mothers choose family-friendly jobs over high wage jobs.

Results: Child Penalty

Figure 5

A: Occupational Rank

Levels 1-5 from Unskilled Labor to Manager

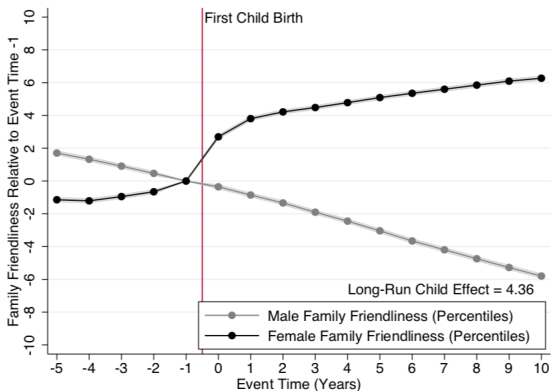


Results: Child Penalty

Figure 5

D: Family Friendliness of Firm

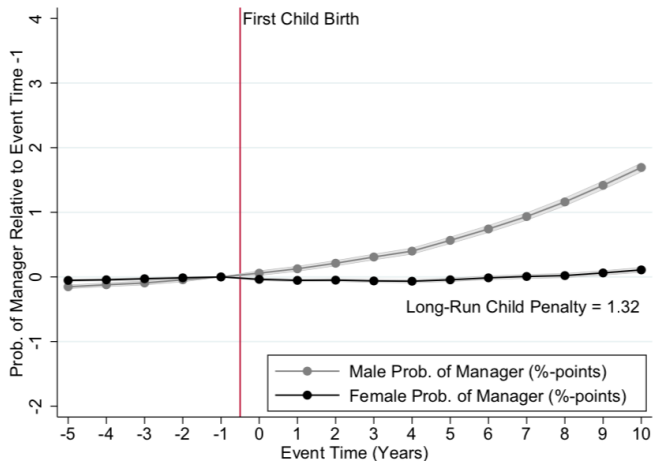
Share of Women with Young Children in the Firm



Results: Child Penalty

Figure 5

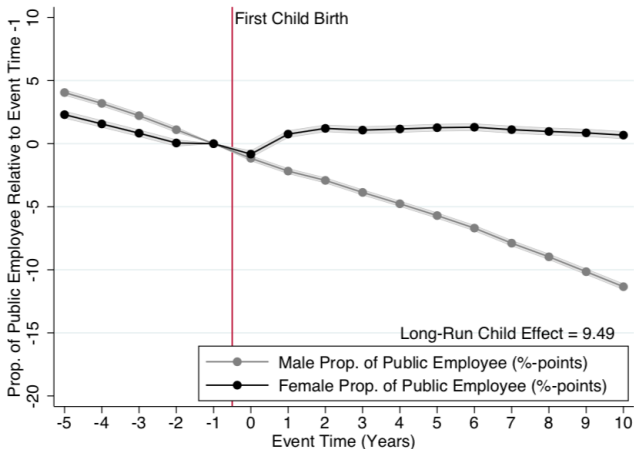
B: Probability of Being Manager Manager Dummy



Results: Child Penalty

Figure 5

C: Probability of Public Sector Job Public Sector Dummy



Introduction

Institutions and Data

Impact of Children

Estimating the Impacts of Children

Identification

Intergenerational Transmission of Child Penalties

Identification

- Anticipated lifetime fertility path

$$\mathbf{k}_i = (0, \dots, k_{it}, \dots, k_{iT})$$

- Earnings at t are a function of $\mathbf{k}_i$:

$$Y_{it} = F(k_{it}, \mathbf{x}_{it}, \mathbf{z}_{it}) \quad (1)$$

$$= F(k_{it}, \mathbf{x}(k_{it}, \mathbf{k}_i, \mathbf{z}_{it}), \mathbf{z}_{it}) \quad (2)$$

- $\mathbf{x}$ are children-related earnings determinants: hours, occupation, sector, firm
- while $\mathbf{z}_{it}$ are others: age, ability, preferences.
- Notice that labor choices $\mathbf{x}(k_{it}, \mathbf{k}_i, \mathbf{z}_{it})$ can depend on entire path $\mathbf{k}_i$

Assumptions

- The arrival of children is exogenous to outcome Y_{it} conditional on $\mathbf{z}_{it}$
- Child-birth is not determined by Hours worked, for example.
- clearly confirmed by the figures.
- Remember that we **only** can identify **post child effects**.

Identified Object

Short run: *just* before and after t

- To estimate short-run effect, denote before/after by t_- , t_+ and fill in (2):

$$\begin{aligned} E[Y_{it+} - Y_{it-}] &= E[F(1, \mathbf{x}(1, \mathbf{k}_i, \mathbf{z}_{it+}), \mathbf{z}_{it+})] \\ &\quad - E[F(0, \mathbf{x}(0, \mathbf{k}_i, \mathbf{z}_{it-}), \mathbf{z}_{it-})] \end{aligned} \quad (3)$$

- Smooth non-child path is

$$E[F(0, \mathbf{x}(0, \mathbf{k}_i, \mathbf{z}_{it-}), \mathbf{z}_{it-})] \approx E[F(0, \mathbf{x}(0, \mathbf{k}_i, \mathbf{z}_{it+}), \mathbf{z}_{it+})] \quad (4)$$

- Assuming (4), (3) identifies **short-run effect** of first child.

Identification Checks

- Men and Women without children as control group.
 - assign placebo births to people without children in the data.
 - two types: people with no children ever, and people without children at t .
- Sibling Sex mix and twin births as IV
- all are largely consistent with the results.

Introduction

Institutions and Data

Impact of Children

Estimating the Impacts of Children

Identification

Intergenerational Transmission of Child Penalties

Intergenerational Transmission?

Why are penalties so large and persistent?

- Importance of gender identity norms? What are women **supposed to do**?
- This paper can link children to their parents and both their maternal and paternal grandparents
- Can we learn anything about the child penalty from the labor market history of the grandparents (of the newborn)?

Setup of Transmission study

- Construct a rank in the distribution of grandparental difference in hours worked: $\mathcal{D}^m = h_i^{mm} - h_i^{mf}$ and $\mathcal{D}^p = h_i^{pm} - h_i^{pf}$
- A higher rank indicates that i 's parents were more *modern* in the sense that grandma worked relatively more.

$$Y_{is}^g = \sum_q \alpha_q^g \mathbf{1}[\text{after}_{is}] \cdot \mathbf{1}[\text{grand}_{iq}^m] + \sum_k \beta_k^g \mathbf{1}[k = \text{age}_{is}] + \sum_y \gamma_y^g \mathbf{1}[y = s] \\ + \delta^g X_i^m + \nu_{is}$$

where

- $\mathbf{1}[\text{after}_{is}]$ indicates having first child in year s
- $\mathbf{1}[\text{grand}_{iq}^m]$ indicates maternal grandparents being at quantile q of $\mathcal{D}^m$
- Construct again penalty P_q as before.

Controls

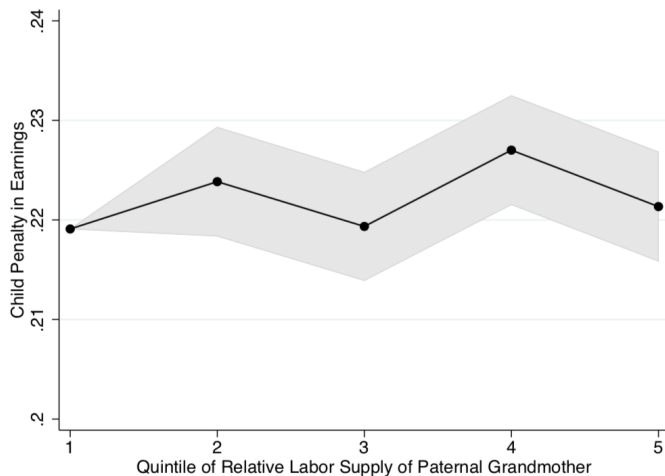
- **Importantly**, in X_i^g they control for a large set of observables to make sure this is not about transmission of other characteristics.
 - length and field of education of both grandparents
 - Wealth and birth cohort for both

Results: Intergenerational Transmission of Child Penalty

Figure 10

B: Paternal Grandparents

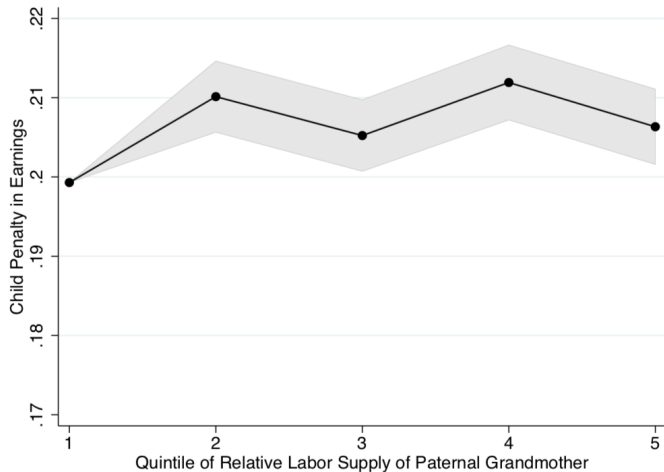
No Controls



Results: Intergenerational Transmission of Child Penalty

Figure 10

D: Paternal Grandparents Rich Grandparental Controls

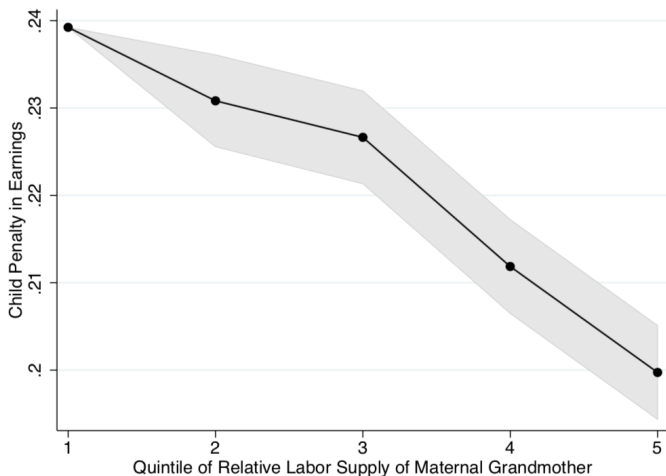


Results: Intergenerational Transmission of Child Penalty

Figure 10

A: Maternal Grandparents

No Controls



Results: Intergenerational Transmission of Child Penalty

Figure 10

C: Maternal Grandparents Rich Grandparental Controls



Discussion

- This speaks to the theory put forward that values get formed in childhood years.
- Girls whose mothers worked more are themselves likely to face a smaller child penalty.
- **Unequal pay** today is due to children.
- Now what?

Discussion

- Is that a good thing or a bad thing?
- Do women have a comparative advantage for bringing up children?
- What's the role of employers in all this? Statistical discrimination against women builds a glass ceiling?
- Should we force fathers to take 50% of total parental leave?

References

Henrik J Kleven, Camille Landais, and Jacob E Sogaard. Children and gender inequality: Evidence from denmark. *Unpublished manuscript, LSE*, 2015. URL

http://www.henrikkleven.com/uploads/3/7/3/1/37310663/kleven-landais-sogaard_gender_oct2016.pdf.

David Card, Jörg Heining, and Patrick Kline. Workplace heterogeneity and the rise of west german wage inequality. *The Quarterly Journal of Economics*, 128(3):967–1015, 2013.