Parental Leave Policy and Mothers' Long-run Earnings

(joint work with Corinna Frodermann, IAB and Aline Zucco, HBS)

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Outline

Motivation

What are we interested in?

▶ Germany had changed its parental leave scheme in 2007

▶ It switched from a means-tested benefit (24 months) to an income replacement (12 months) with a partner quota (2 months)

▶ This reform has changed the duration of mothers' parental leave: longer leaves for high-income mothers, shorter leaves for low-income mothers

▶ **How did it affect the earnings of mothers in the long run (7-9 years after giving birth)?**

Why is this relevant?

► What is the optimal design of maternal leave?

⇒ Trade-off between employment rates and earnings

► Short maternity leave has positive effects on the return probability and on earnings

► Longer leaves increase mothers' employment rates, but decrease earnings

What do we do?

▶ We estimate the effect of the 2007 parental leave reform on mothers' earnings in the long run (7-9 years after giving birth)

▶ Identification is based on the quasi-experimental setting caused by the timing of the reform

▶ Empirical analysis is based on administrative data on employment and earnings as well as on survey data on working hours

What do we contribute?

▶ Large literature of the 2007 parental leave reform on employment
  – Negative employment effect in the first year (Kluve and Tamm, 2013; Kluve and Schmitz, 2018; Bergemann and Riphahn, 2015; Geyer, Haan, and Wrohlich, 2015)
  – but positive effects in the medium run (Kluve and Schmitz, 2018)
  ⇒ No research on long run effects

▶ Few research on the effects on mothers' careers in the medium run
  – Positive Effects on job quality and job stability (Kluve and Schmitz, 2018)

▶ Evidence of previous parental leave reforms and other countries show that longer employment interruptions do not affect long-term earnings (Schönberg and Ludsteck, 2014; Lalive, Schlosser, Steinhauer, and Zweimüller, 2014)
  ⇒ So far, no study on the effects of the 2007 parental leave reform on mothers' earnings

What do we find?

▶ 2007 parental leave reform increases employment interruptions for high-income mothers

▶ High-income mothers have higher earnings in the medium run and long run

▶ No effects for low- or medium-income mothers

▶ Potential mechanism: increased leave-taking of fathers

Outline

Institutional Framework

Institutional framework

▶ PLR in 2007:
  – Old parental leave benefit (Erziehungsgeld) was replaced by the Elterngeld

▶ Aims of the PLR:
  1. Safeguarding family income during the first year after childbirth
  2. Promoting mothers' economic independence
  3. Improving gender equality by supporting fathers' parental leave and by simplifying mothers' return to the labor market
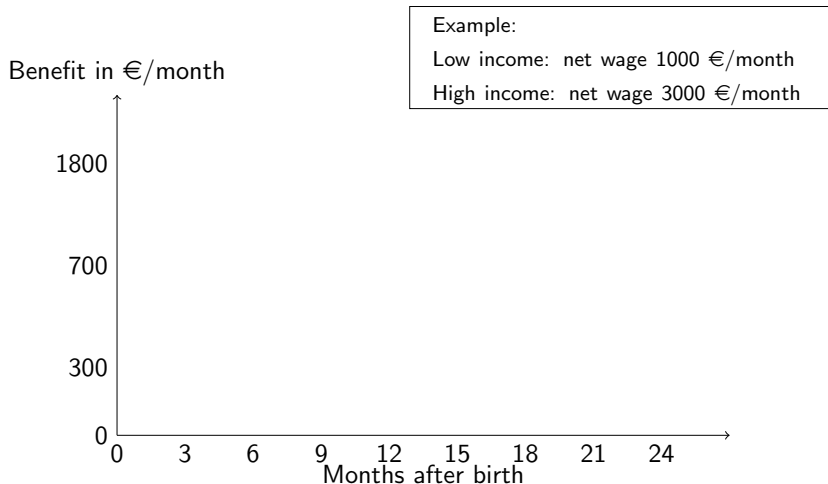
Old vs. new parental leave benefit

Old benfit (Erziehungsgeld) for births until 2006:
- ▶ Means-tested (HH income $< 30,000$ €)
- ▶ Benefit: 300 €/month
- ▶ Duration: two years
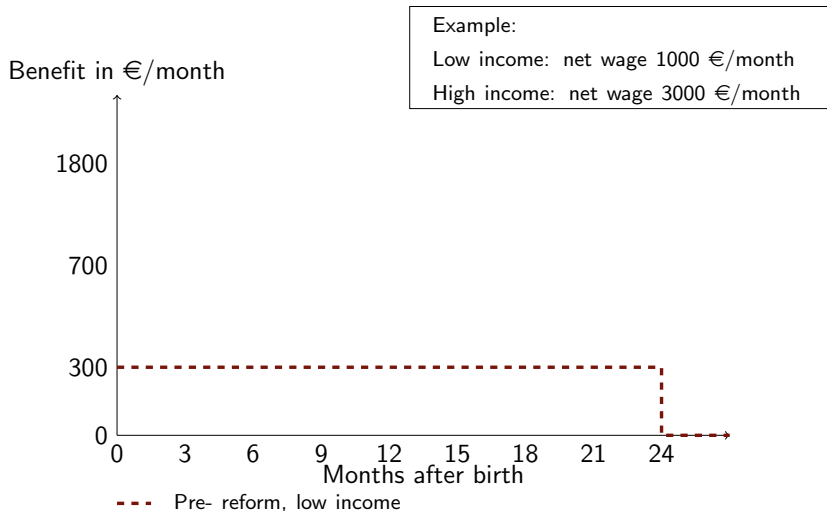

New benefit (Elterngeld) for births since 2007:
- ▶ Earnings related transfer
- ▶ Benefit: 65-67 % of previous net wage (300-1800 €/month)
- ▶ Duration: one year
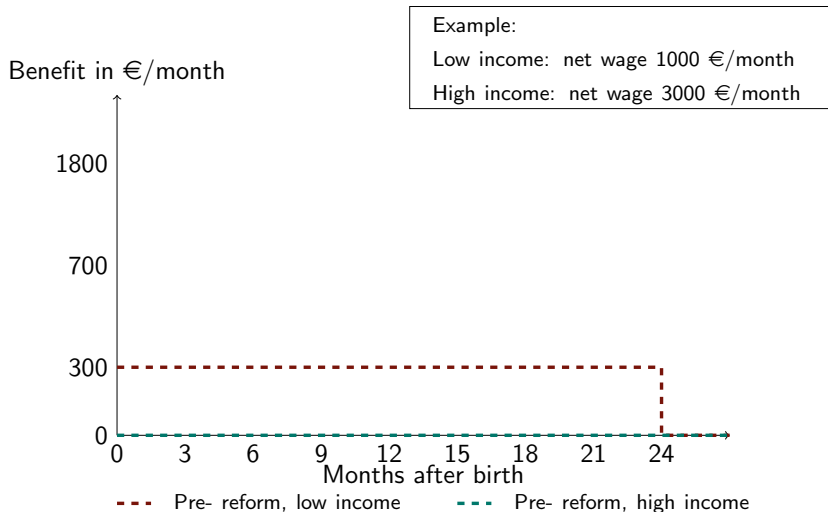- ▶ 2 "Daddy" months

Benefits pre- and post reform

Example:

Low income: net wage 1000 €/month

High income: net wage 3000 €/month

Benefit in €/month

1800

700

300

0

0   3   6   9   12   15   18   21   24

Months after birth

Source: Welteke and Wrohlich (2016)

Benefits pre- and post reform

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Benefit in €/month

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Months after birth

- - - Pre- reform, low income

Source: Welteke and Wrohlich (2016)

Benefits pre- and post reform

Example:
Low income: net wage 1000 €/month
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0 3 6 9 12 15 18 21 24

Months after birth

- - - Pre- reform, low income   - - - Pre- reform, high income

Source: Welteke and Wrohlich (2016)

Benefits pre- and post reform

Example:
Low income: net wage 1000 €/month
High income: net wage 3000 €/month

Benefit in €/month

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0 3 6 9 12 15 18 21 24

Months after birth

- - - Pre- reform, low income   - - - Pre- reform, high income

——— Post-reform, low income

Source: Welteke and Wrohlich (2016)

Benefits pre- and post reform
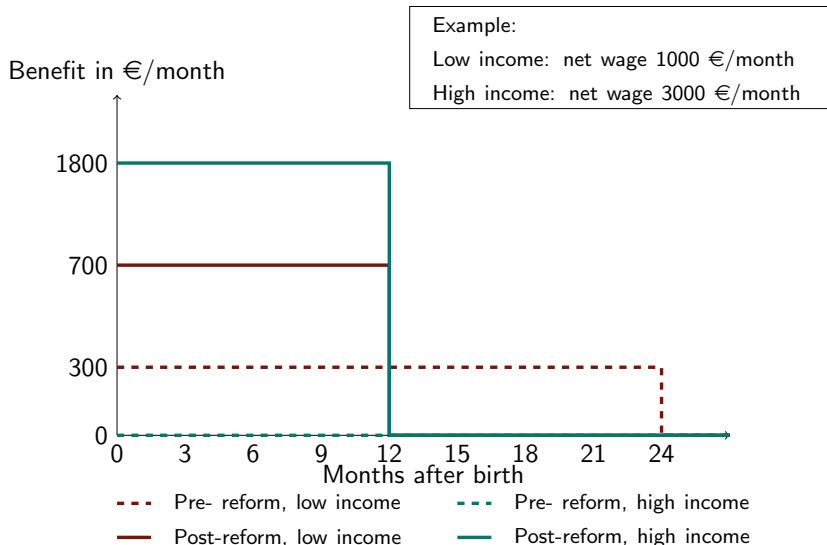
Source: Welteke and Wrohlich (2016)

Outline

Hypotheses

Low-income mothers

Expected long-run effects:

Employment interruptions ↓ ↑
  ⇒ Mean effects on earnings (cond. on working)?

High-income mothers

Expected long-run effects:

Employment interruptions ↑

⇒ Mean effects on earnings (cond. on working)?

Why?

▶ Human capital\Signaling theory (Spencer, 1973; Becker, 1985) ↓

▶ Establishment of a social norm that reduces uncertainty for employers (Kluve and Schmitz, 2018) ↑

▶ Empirical evidence on previous reforms/other countries: zero

Outline

Method

Empirical Strategy

Diff-in-Diff:

$$Y_{it} = \alpha + \beta \text{FirstQuarter}_{i0} + \gamma \, \text{Reform}_{i0}$$
$$+ \delta \text{FirstQuarter}_{i0} \cdot \text{Reform}_{i0} + \omega X_{it} + \epsilon_{it}$$

- Y_{it}: Log Earnings (Daily wage)
- $\text{FirstQuarter}_{i0} = \begin{cases} 1 \text{ First birth first quarter of the year} \\ 0 \text{ First birth last quarter of the year} \end{cases}$
- $\text{Reform}_{i0} \quad = \begin{cases} 1 \text{ First birth} \pm 1 \text{ quarter around Jan 1 2007} \\ 0 \text{ First birth} \pm 1 \text{ quarter around Jan 1 2006} \end{cases}$
- X_{it}:
  - Socio-economic characteristics (e.g. age, education, ...) and pre-birth employment information (e.g. earnings, firm size, region,...)

Definition of treatment and control group

Outline

Data

Data Sets
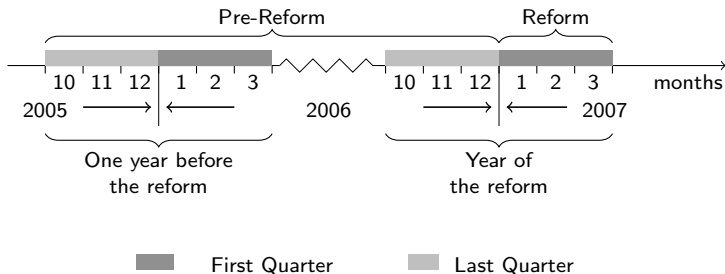
Integrated Employment Biographies (IEB)

▶ Covers the universe of the working population subject to social security 1976-2016 (For the female workforce: 84 % of the total working population (Statistisches Bundesamt, 2017))

▶ Administrative data on (un-)employment spells provided by the Institute of Employment Research (IAB)

    – Information on daily earnings

    – Information on the entire employment biographies (subject to social security), education and citizenship

    – Matched with the Establishment History Panel (BHP) ⇒ information on employer

    – But no information on birth and motherhood

       → Birth identification approach by Müller and Strauch (2017)

       → Exclusion of births $\pm$ 2 weeks around cut-off point

Sampling

▶ Mothers whose first child is born in 09/2005 - 03/2006 or 09/2006 - 03/2007
▶ Who have been employed 10 months prior to giving birth
▶ We exclude mothers who gave birth two weeks before or after January 1st

Sample 9 years after giving birth (IEB)

Low-income mothers (pre-birth gross earnings below 1120 Euro/month; 25th percentile)

	2005/06	2006/07	Total
Last Quarter	6,312	6,323	12,635
First Quarter	6,165	6,277	12,442
Total	12,477	12,600	25,077

High-income mothers (pre-birth gross earnings above 2390 Euro/month; 75th percentile)

	Pre-Reform	Reform	Total
Last Quarter	7,501	7,793	15,294
First Quarter	8,144	8,644	16,788
Total	15,645	16,437	32,082

Microcensus

- ▶ Covers 1% of German households
- ▶ Waves: 2008 – 2016
- ▶ Household survey provided by the Federal Statistical Office
    - ▶ Large set of personal variables (e.g. citizenship, age, place of residence)
    - ▶ Additional information on household characteristics (e.g. number of children and month of their births and marital status) and on employment (e.g. working hours)
    - ⇒ Allows to analyze differences in the group composition and in the working hours
- ▶ Broader definition of treatment and controls: 1st vs. 2nd half-year instead of 1st vs. 4th quarter

Outline

Results

1. Duration of Employment Breaks
2. Effects on Earnings

1. Duration of Employment Breaks

Low-income mothers — High-income mothers

Legend:
- Treatment: First Quarter 07
- Control: First Quarter 06
- Control: Last Quarter 06
- Control: Last Quarter 05
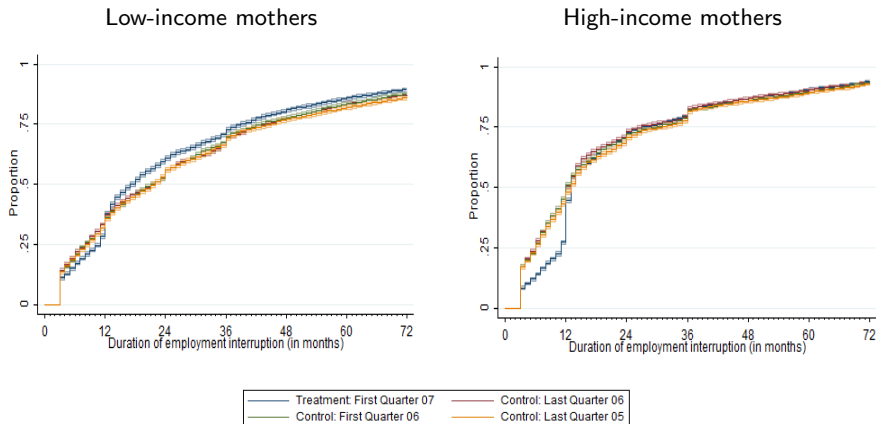
⇒ No reform effects on the duration of career breaks for low-income mothers and longer breaks for high-income mothers (∅ 2 months) after the reform

2. Effects on Earnings
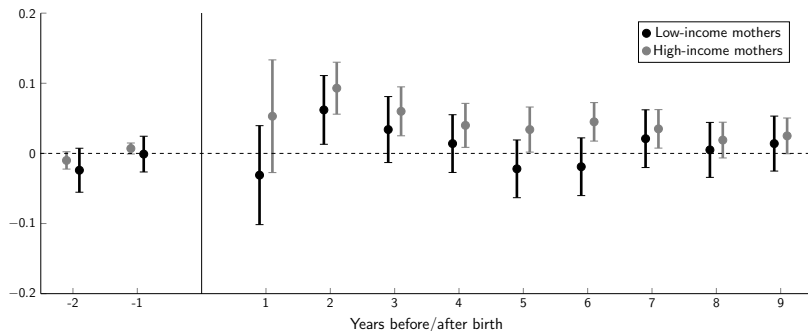
Source: IEB 1975-2016;

⇒ No reform effects on daily earnings for low-income mothers; Positive effects for high-income mothers

Why are the earnings of high-income mothers positively affected by the reform?

- ▶ Working hours?
- ▶ Changes in socio-demographic characteristics and fertility?
- ▶ Changes in employer stability?
- ▶ Changes in father's parental leave taking

Working hours, high-educated mothers

Working hours for the working population
High-income mothers

Legend: 1st 2007 — 2nd 2006 — 1st 2006 — 2nd 2005
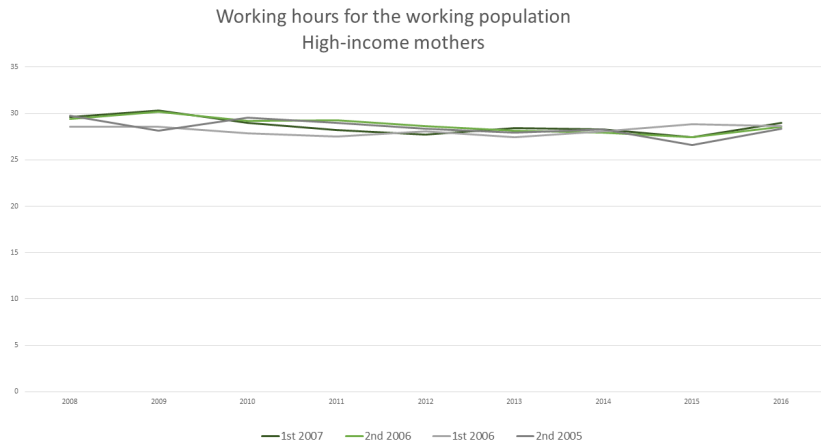
Source: Microcensus 2008-2016;

Working Hours, low-educated Mothers

Working hours for the working population
Low-income mothers

Legend: 1st 2007, 2nd 2006, 1st 2006, 2nd 2005
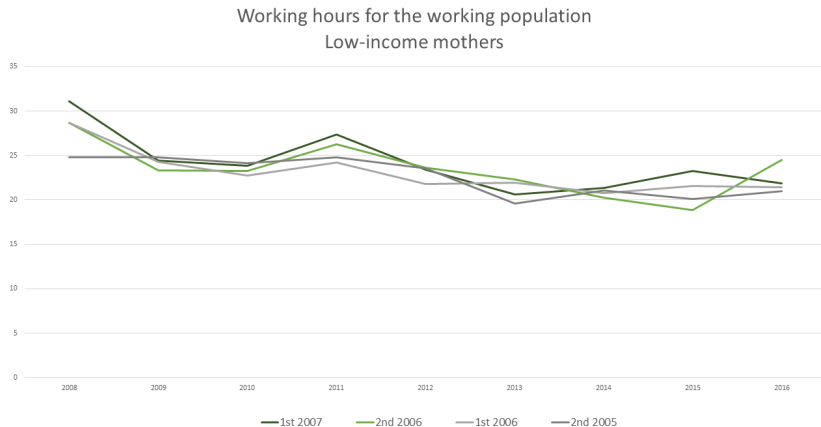
Source: Microcensus 2008-2016;

⇒ No reform effects on the numbers of working hours neither for high- nor for low-income mothers

Job Stability

We find that

▶ The probability to return to the same employment is higher due to the reform

▶ Earnings are the same for mothers in both groups

Effects on Earnings
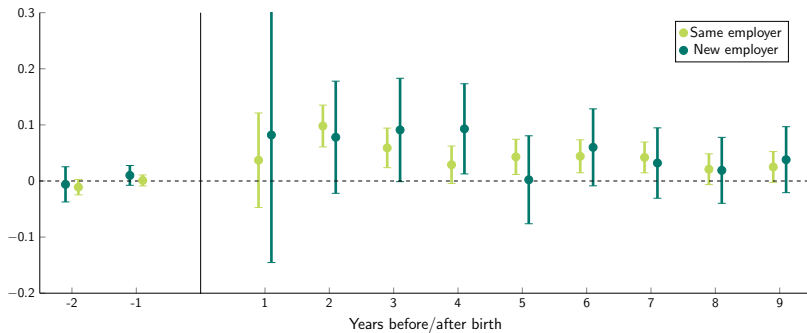
Source: IEB 1975-2016;

Fathers Parental Leave Taking

Fathers parental leave taking

▶ The reform strongly increased fathers' parental leave taking, in particular in the group of fathers with highly educated partners

▶ In many couples, fathers are taking leave while the mother is working

▶ If fathers take leave, they participate more in childcare and household chores later on

⇒ Suggestive evidence that the increase in fathers' leave taking might cause the positive earnings efffects for high-income mothers

Conclusion

Conclusion

How did the parental leave reform affect mothers' careers?

▶ Employment rates:
  – Longer career interruptions for high-income mothers (2 months)
  – No effects for low-income mothers
▶ Working hours:
  – No changes in the working hours due to the reform
▶ Earnings:
  – No negative effects on long-term earnings for any group
  – Positive effects for high-income mothers

Policy Conclusion

Good news

▶ Longer employment interruptions of high-income mothers did not have a negative impact on their earnings

▶ This is possibly due to the creation of a social norm of taking exactly 12 months of leave, which creates stability for employers

▶ Trade-off between "safeguarding family income" and "promoting mothers" could have been resolved by the "daddy quota"

However:

▶ Low-income mothers did not benefit from the reform

Thank you for your attention!

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Uta Schönberg and Johannes Ludsteck. Expansions in maternity leave coverage and mothers' labor markt outcomes after childbirth. Journal of Labor Economics, 32(3):469–505, 2014.

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Father's leave taking

Figure: Father's leave taking
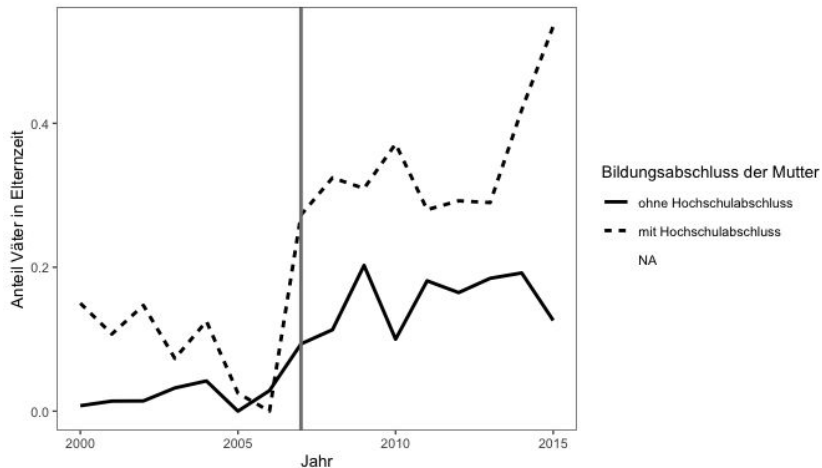
Part-Time/ Full-time

"Teilzeit" Variable (original)   Pre-birth earnings + midi-jobs
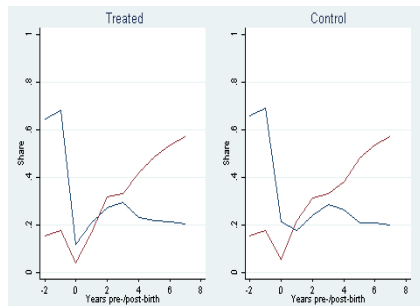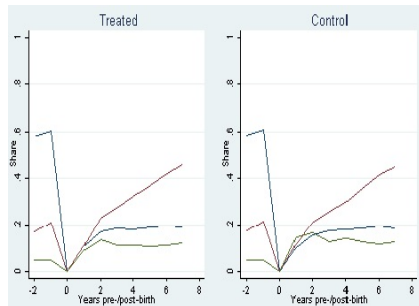
Part-Time/ Full-time

Pre-birth earnings + midi-jobs
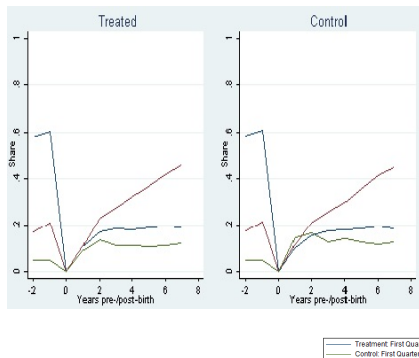
Additonal 2012 Information
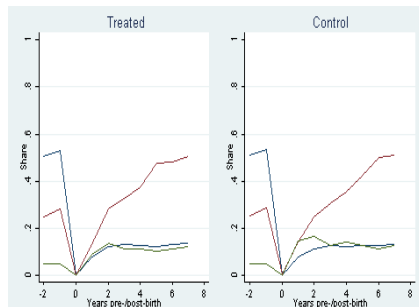
Working time 7 to 9 years after birth

Working hours by treatment status
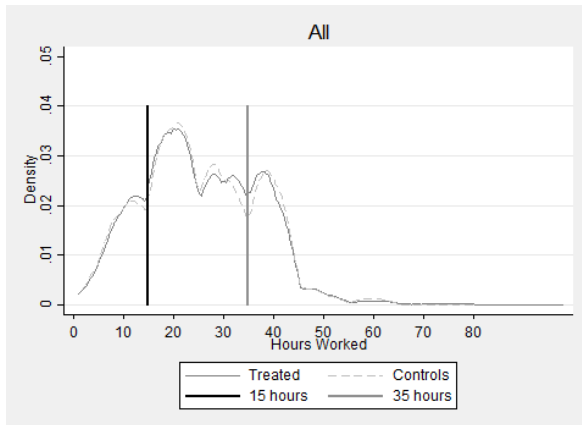
Working time 7 to 9 years after birth by number of children

Working hours by treatment status
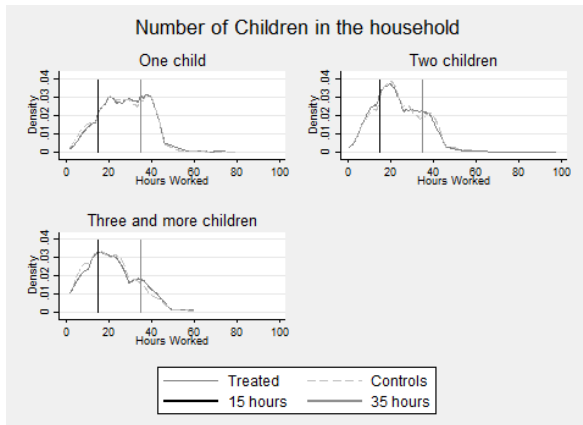
Working time 7 to 9 years after birth by status of relationship

Working hours by treatment status
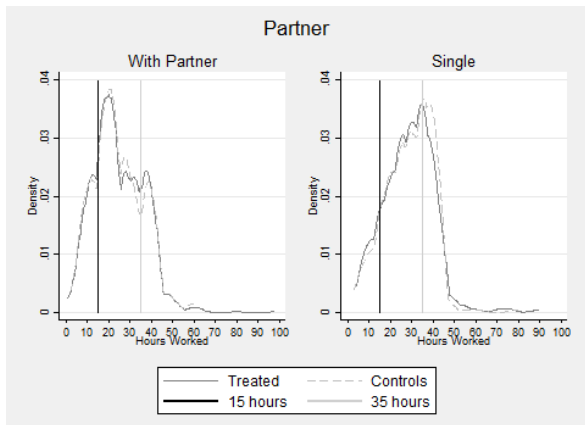
Working time 7 to 9 years after birth by age

Working hours by treatment status
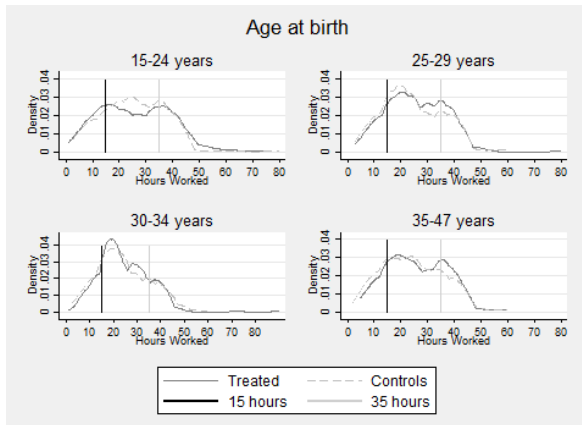
Working time 7 to 9 years after birth by training

Working hours by treatment status
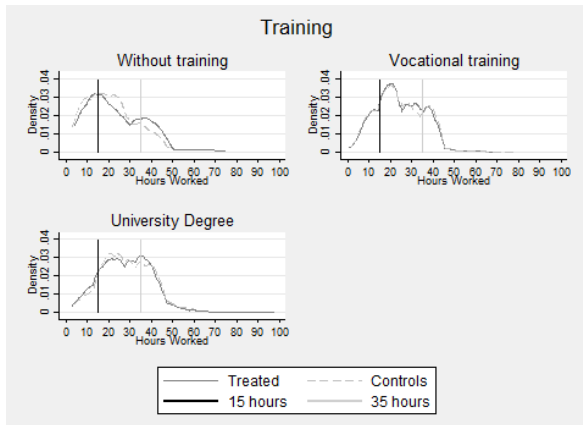
Sample East/West

	Low-income mothers	High-income mothers	Total
East	11,027	4,937	15,964
West	26,969	41,498	68,467
No information	13,322	4,885	18,207
Total	51,318	51,320	102,638

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Problems and potential solutions

▶ Top coded earnings and missing or wrong information on school degree

  → Imputation method by Reichelt (2015)

▶ No information on birth and motherhood

  → Birth identification approach by Müller and Strauch (2017)
  → Exclusion of births $\pm$ 2 weeks around cut-off point

▶ Wrong information on full-time/part-time work

  1. Use pre-birth earnings and wage limits to modify the working time + Use 'midi-jobs' to differ between marginal employment and part-time ▸ Adjustment
  2. Change in the data collection method in 2011 (Ludsteck and Thomsen, 2016) $\Rightarrow$ Assume reports in 2012 to be more correct ▸ Adjustment

▸ Back

Sample Size in the Microcensus

	Reform	Pre-Reform	Total
First Quarter	1,232	1,169	2,401
Last Quarter	1,220	1,325	2,545
Total	2,452	2,494	4,946

	Without University degree	With University degree	Total
Treated	900	332	1,220
Control	872	348	1,232
Total	1,772	680	2,452

Wage effects West Germany
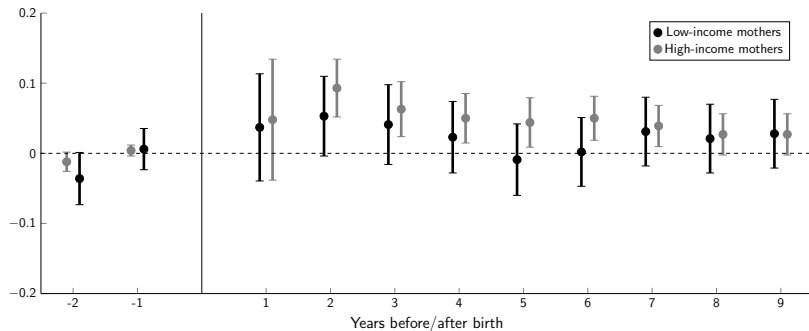
IEB 1975-2016;

Source:

Wage effects without Controls
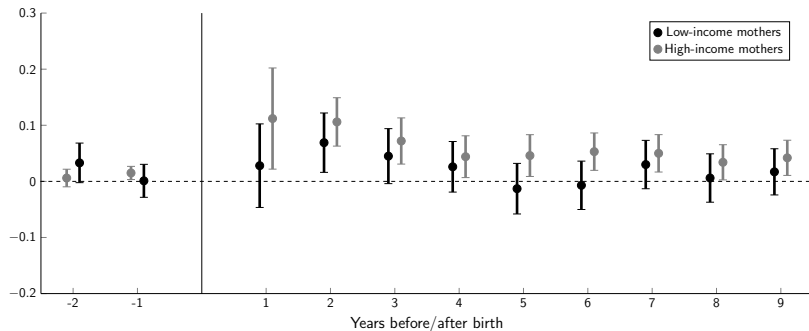
IEB 1975–2016; ▸ Back

Source:

Effects on earnings in East Germany
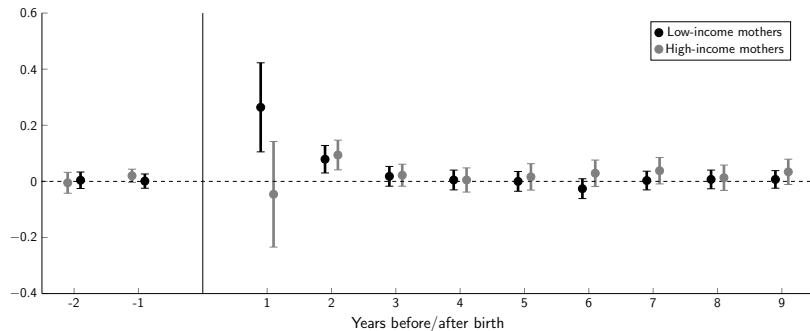
IEB 1975-2016; ▸ Back

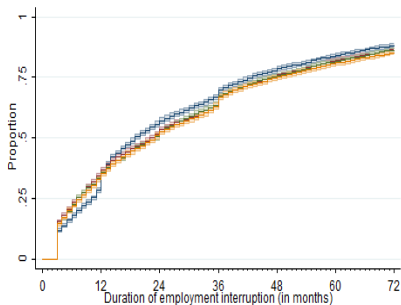Source:

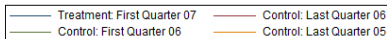# Wage effects for Medium-income mothers
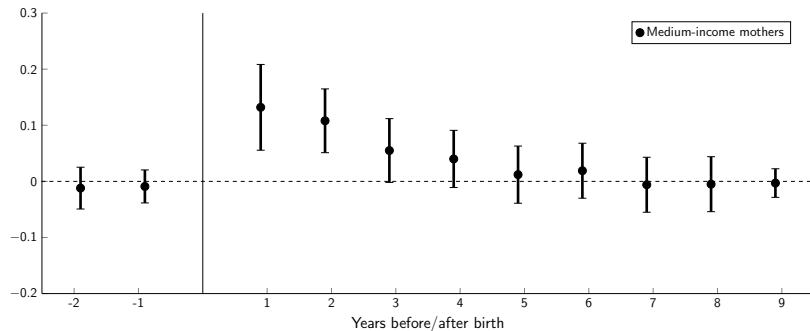
IEB 1975-2016; ▸ Back

Source:

Duration of employment break in West Germany

Low-income mothers   High-income mothers

Legend:
- Treatment: First Quarter 07
- Control: First Quarter 06
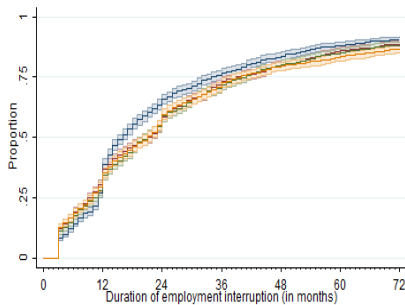- Control: Last Quarter 06
- Control: Last Quarter 05
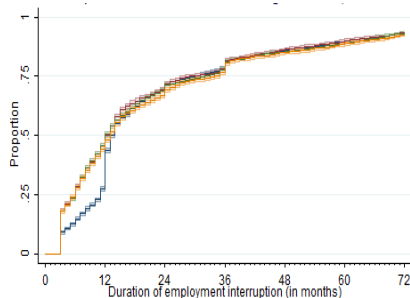
⇒ Longer career breaks for low-income (0.6 months) and for high-income mothers (∅ 2 months) after the reform
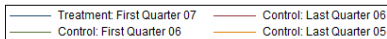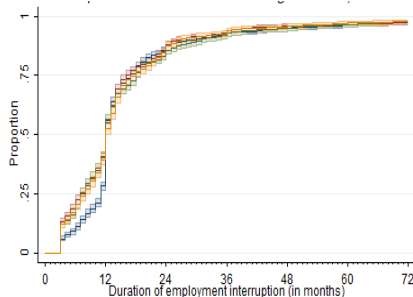
▸ back

# Duration of employment break in East Germany

Low-income mothers

High-income mothers

⇒ No reform effect on the duration of career breaks for low-income mothers and longer breaks for high-income mothers (∅ 1 months) after the reform
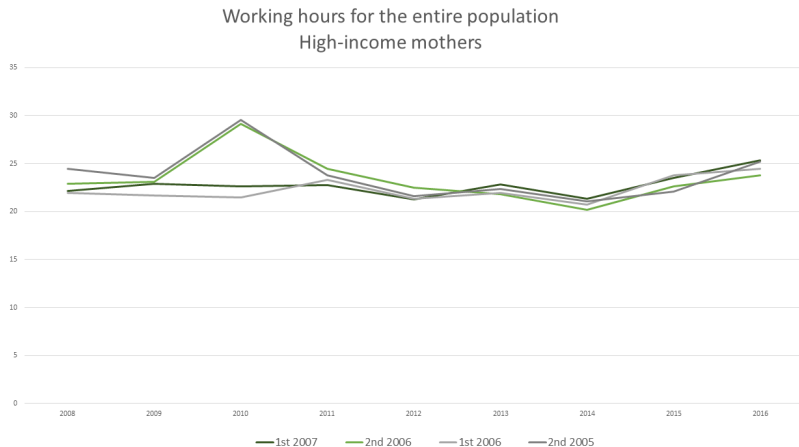
▸ back

Working hours, high-income mothers, incl. non-working population

Working hours for the entire population
High-income mothers

Legend: 1st 2007, 2nd 2006, 1st 2006, 2nd 2005
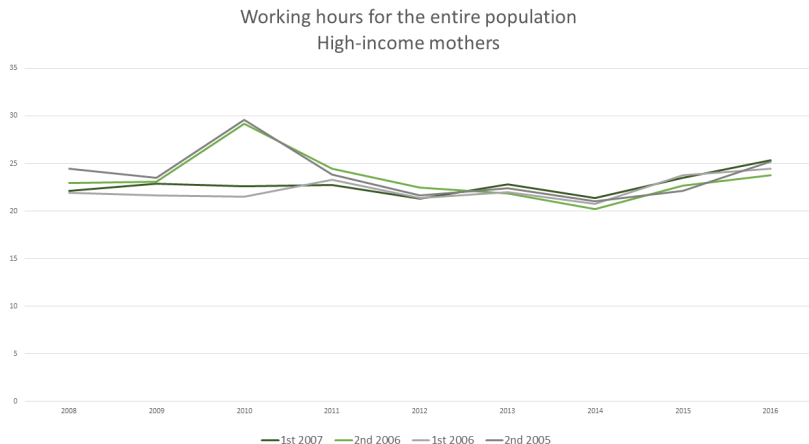
Working hours, low-income mothers, incl. non-working population

Working hours for the entire population
High-income mothers

Sample 9 years after giving birth (MC)

Low-educated mothers (no vocational training, no high-school degree)

	2005/06	2006/07	Total
Last Quarter	75	86	161
First Quarter	66	59	125
Total	141	145	286

High-educated mothers (tertiary degree)

	Pre-Reform	Reform	Total
Last Quarter	430	408	838
First Quarter	400	396	796
Total	830	804	1634

▸ back