A Firm-Side Perspective on Parental Leave

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ASSA 2021 Session: *Parental Leave Effects on Firms and Workers*

Motherhood, parental leave and firms

Large literature on effects of motherhood and parental leave policies on women's careers

Adda et al. (2017); Angelov et al. (2016); Bana et al. (2020); Dahl et al. (2016); Kleven et al. (2019); Kluve and Schmitz (2018); Lalive and Zweimüller (2009); Schönberg and Ludsteck (2014)

Motherhood and parental leave may also affect firms and women more broadly

Costs of (temporary) absence of a worker and replacing her
Costs can influence hiring and promotion decisions via statistical discrimination (e.g. stressed by Bertrand, 2018)

Scarce empirical literature on effects of motherhood and leave on firms

Brenøe et al. (2020, Denmark): effect of any birth (no policy change), costs for firms negligible
Gallen (2019, Denmark): parental leave expansion increases firm shut down
Ginja et al. (2020, Sweden): parental leave expansion increases firms' labour costs

⟩ Results suggest firms can cope with motherhood per se, but extending leave duration seems harmful

How to reconcile zero effects w/o reforms with adverse effects from expansions

Firms will try to keep absences low for positions where workers are hard to replace (Hensvik and Rosenqvist, 2019, on sickness absences)

Expect shorter employment interruptions for harder to replace mothers due to sorting (e.g. via statistical discrimination) and incentives set by employer

⟩ Interplay between how hard a mother is to replace and length of leave?

⟩ Do parental leave reforms disturb such an interplay?

> Change mothers' value of non-employment and thus their labour supply
> For the firm, sorting is given (in the short-run)
> High replacement rates make it costly for firms to react by adjusting incentives

⟩ Disturbing this interplay may distort firm outcomes

Drawback of quasi-experimental estimates: may not capture new equilibrium

This paper

Using administrative data containing the universe of workers covered by social insurance in Germany, our paper investigates ...

- Relationship between mothers' length of leave and her substitutability
  - Under means-tested and generous earnings-based benefit scheme
- Effect of parental leave extension on mothers' return to their previous employers and on firms' long-run outcomes
- Hiring patterns of firms around childbirth and effect of longer leave on statistical discrimination against *potential mothers* in affected firms

Institutional Setting & Data

Institutional setting and Germany's 2007 paid parental leave reform

Throughout period considered:

36 months of job protection & no direct expenses for employers

Births before January 1, 2007: means-tested scheme

> Around 25% of families were ineligible for any benefit
> Max. 300 Euro/month for 24 months

Births after January 1, 2007: universal & earnings-based

> Replaces 67% of pre-birth (net) earnings, capped at 1,800 Euro/month
> ⚠ incentivised higher-income mothers to take longer leave
> Paid for up to 12 months to one parent, +2 months to other partner

Law passed in September 2006, children born until June 2007 conceived by then (Raute, 2019)

Administrative linked employer–employee data

Administrative data from Institute for Employment Research (IAB)

- IEB: Information on all workers covered by social insurance in Germany (excludes self-employed and civil servants)
- Job duration and employment interruptions, wages (top-coded), firm, occupation, job tenure, citizenship, education, age
- Full labour market history of workers at *daily level* from 1975-2018
- Wages reported as annual average
- Apply procedure by Müller and Strauch (2017) to identify mothers
  - At beginning of paid maternity leave employers notify social insurances
  - ⚡ expected date of delivery is 6 weeks after this notification

Sample selection

Analysis period: births from July 2005-June 2007

  Chosen to capture Germany's paid parental leave reform

For clean identification at firm-level: firms with one birth $+/-$ 2 years

! small- and medium-sized firms, which are at heart of debate on adverse effects of parental leave `firm size distribution`

First-time mothers with previous monthly gross earnings $>$ 1.700 euro / month and tenure of at least 10 months

  Earnings ensure monotonic reform effect
  Tenure ensures existence of employer-specific skills

Pre-birth at private sector firm

Analysis sample consists of 26,609 mothers (& firms)

`comparison of analysis sample with dropped observations`

Substitutability of mothers

To replace an absent mother, employer needs workers to perform her tasks

Internal substitutes *(workgroup)*

- Workers in same 3-digit occupation (e.g. Cornelissen et al., 2017)
- Assignment 10 months pre-birth (following Hensvik and Rosenqvist, 2019)
- Median (mean) workgroup size : 4 (7.2) distribution
- ! little costs, but limited flexibility

External replacements. Two dimensions:

- Share in same *occupation* in regional labour market (Jäger and Heining, 2019)
- Share in same *industry* (Ginja et al., 2020)
- Both calculated as relative to national share
- ! substantial fixed costs, more attractive with longer leave

Descriptives and balancing

Births in...	Mean					DD coef.
	All (1)	Jul-Dec 05 (2)	Jan-Jun 06 (3)	Jul-Dec 06 (4)	Jan-Jun 07 (5)	(6)
Individual characteristics						
Age in years	29.993	29.825	30.139	29.882	30.154	-0.042
						(0.098)
East Germany	0.106	0.102	0.110	0.108	0.104	-0.012
						(0.008)
German citizenship	0.957	0.958	0.954	0.961	0.956	-0.001
						(0.005)
High education	0.385	0.372	0.383	0.384	0.405	0.010
						(0.012)
Wage 18 months pre-birth	2566.147	2587.753	2558.203	2575.839	2539.467	-6.823
						(22.444)
Tenure at pre-birth firm in days	1730.338	1710.971	1710.181	1757.909	1743.209	-13.910
						(34.307)
Full-time employed	0.943	0.946	0.944	0.941	0.941	0.001
						(0.006)
Pre-birth firm characteristics						
Firm size	21.654	21.874	21.425	21.512	21.787	0.723
						(0.640)
Workgroup size	7.268	7.439	7.156	7.111	7.355	0.526**
						(0.253)
Observations	26,609	7,155	6,382	6,732	6,340	26,609

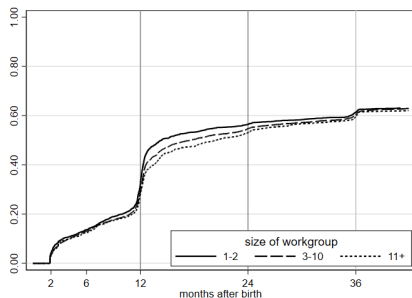summary statistics by replaceability

Parental Leave Absences and Workplace Characteristics

The role of internal replacements

Figure: Return to pre-birth firm
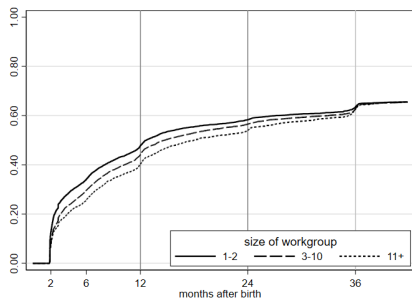
(a) Low entitlements (pre-reform)   (b) Extended paid leave (post-reform)

With low entitlements, mothers with few internal substitutes take shorter leave

Paid leave extension breaks pattern in first 12 months, but returns afterwards

Robustness to controls and external replacements

Table: Relationship between availability of internal substitutes and parental leave length

	Dep. variable: (log) days to return to firm					
	Pre-reform			Post-reform		
	(1)	(2)	(3)	(4)	(5)	(6)
(log) work group size	0.0759***	0.0747***	0.0700***	0.0429*	0.0479*	0.0297
	(0.0193)	(0.0215)	(0.0218	(0.0248)	(0.0276)	(0.0187)
(log) industry thickness	0.0492	0.0755**	0.0519*	0.0211	0.0237	0.0049
	(0.0373)	(0.0371)	(0.0298)	(0.0428)	(0.0426)	(0.0210)
(log) occupation thickness	0.0130	0.0464	0.0301	0.0019	0.0701	0.0537
	(0.0649)	(0.0665)	(0.0526)	(0.0749)	(0.0846)	(0.0449)
N	13,110	13,110	9,744	6,337	6,337	2,932
Sample	Full	Full	14mo	Full	Full	14mo
Labour market FEs	Y	Y	Y	Y	Y	Y
Individual controls		Y	Y		Y	Y
Occupation FEs		Y	Y		Y	Y

Controls: age, education, migrant background, tenure at firm, pre-birth wage.

Link between internal replacements and length of leave robust to inclusion of controls

External replacements appear less important, only industry thickness in context of low entitlements

Quasi-experimental Evidence: Parental Leave Expansion

Evaluating paid parental extension: Empirical specification

Use monthly panel covering the years 2002 to 2011 to run dynamic DD (Ginja et al., 2020) on mothers and employers

cohort / season	(spring = 0)	(spring = 1)
(reform = 0)	Jul-Dec 2005	Jan-Jun 2006
(reform = 1)	Jul-Dec 2006	Jan-Jun 2007

$$y_{it} = \alpha_i + \sum_{t=-42, t \neq -10}^{54} \gamma_t \; \mathbb{1}(T_t) \; reform_i \; spring_i + \sum_{t=-42, t \neq -10}^{54} \delta_t \; \mathbb{1}(T_t) \; reform_i$$

$$+ \sum_{t=-42, t \neq -10}^{54} \tau_t \; \mathbb{1}(T_t) \; spring_i + \sum_{t=-42, t \neq -10}^{54} \beta_t \; \mathbb{1}(T_t) + \epsilon_{it}$$

$$(1)$$

End categories binned at 42 month pre birth and 54 months post birth

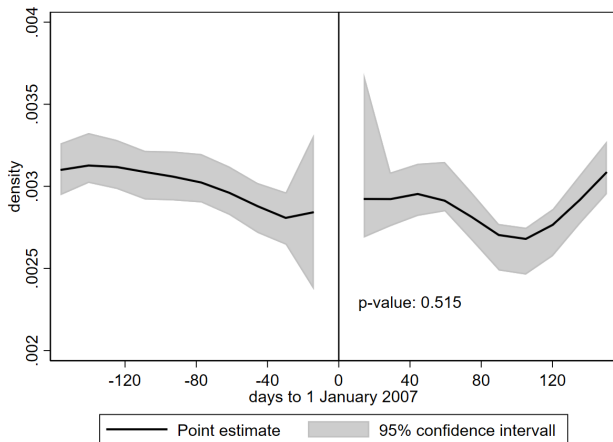y_{it}: outcome for mother (firm) i and time t

γ_t: the coefficients of interest at month t relative to birth (T_t), using 10 months pre-birth as reference

Standard errors clustered at mother (employer) level

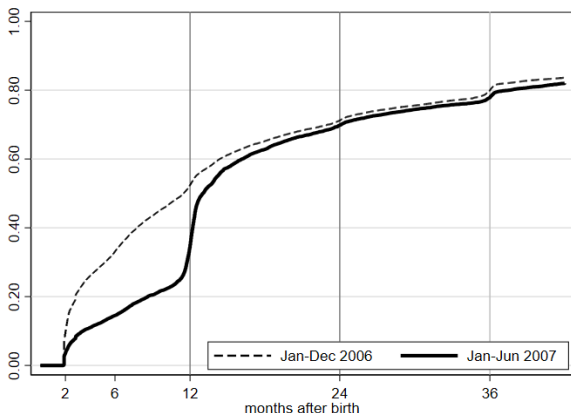Also summarise estimates in short- and long-term coefficients

specification

Births distributed smoothly around the cut-off

Density test for manipulations at the threshold using local polynomial density estimation based on Cattaneo et al. (2018)
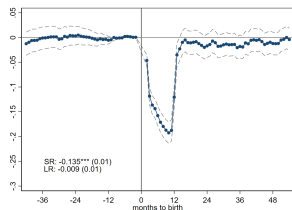
Reform delayed mothers' return to employment

Extended benefits substantially prolong leave with large share returning around expiration of benefits

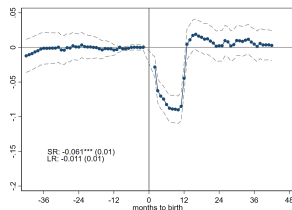Differences minor after 14 months (maximum receipt)

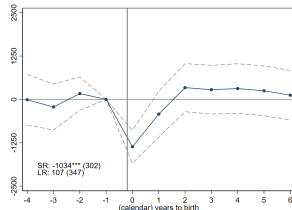Increase of 103 days for mothers returning within 14 months

Figure: Mothers

(a) Return to same firm

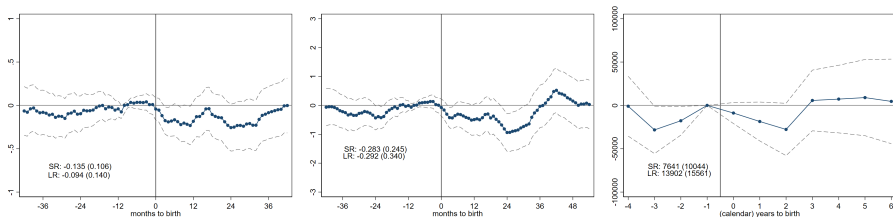(b) Full-time at same firm

(c) Annual wage sum at same firm

Strong shock in first 12 months

After benefit expiration, return to pre-reform levels with little long-term effects

Firms mostly have to fill larger gap in first year

Event study estimates: firms

Figure: Workgroups and firms

(a) Employment in workgroup   (b) Employment at firm   (c) Annual wage sum at firm

Gap due to longer leave absence not entirely filled in workgroups, especially smaller ones `event study graphs by size`

Similarly, wage sum in small workgroup decreases, suggesting no full internal intensive margin compensation

Firm employment insignificantly reduced with no long-term effects on wage sum

⟩ while workgroups cannot fully replace mothers in short-term, long-term aggregate effects seem negligible

Hiring

Look at external labour market for two reasons:
1. Understand its role in bridging longer parental leave absences
2. Analyse if firms adjust hiring in response to reform

Profit maximizing firms internalise (higher) cost of absences and may change hiring composition

- Statistical discrimination; less frequent hiring of women with higher risk of longer parental leave absence
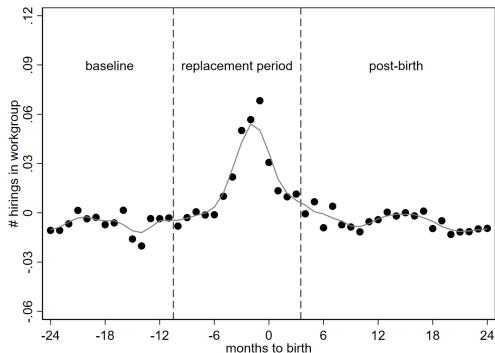- Alternative mechanism; for longer absences firms may find replacements more easily and births become less costly

Eventually all firms face more generous regime. If learning plays role, affected firms may adjust hiring quicker

- Restrict analysis to 24 months post-birth

Hirings in workgroup

Figure: Residualised evolution of hirings (pre-reform)

Constant at baseline with sudden increase after first trimester of pregnancy

Most replacements hired in period when mothers go on leave

On average 0.26 excess hirings per birth (compared to pre-year period)

Use discrete time periods in DD-type estimation

Reform effect on hiring patterns

	All	Workgroups with ... employees		
		1-2	3-10	11+
Men				
Replacement effect	0.0006	0.0009	-0.0009	0.0042
	(0.0017)	(0.0014)	(0.0022)	(0.0066)
Long term effect	-0.0011	-0.0007	-0.0019	-0.0001
	(0.0016)	(0.0012)	(0.0021)	(0.0066)
Women				
Replacement effect	0.0001	-0.0041*	0.0026	0.0012
	(0.0027)	(0.0025)	(0.0037)	(0.0098)
Long term effect	-0.0071***	-0.0036*	-0.0072**	-0.0136
	(0.0024)	(0.0019)	(0.0033)	(0.0092)
Women below age 38 years				
Replacement effect	-0.0013	-0.0030	-0.0004	-0.0003
	(0.0019)	(0.0020)	(0.0029)	(0.0067)
Long term effect	-0.0043**	-0.0024	-0.0048*	-0.0071
	(0.0017)	(0.0015)	(0.0025)	(0.0064)
Women aged 38 years and above				
Replacement effect	0.0001	-0.0010	0.0027	-0.0047
	(0.0013)	(0.0014)	(0.0018)	(0.0047)
Long term effect	-0.0001	-0.0009	0.0006	-0.0003
	(0.0012)	(0.0011)	(0.0016)	(0.0045)
Clusters	26,489	8,960	12,678	4,851
N	1235360	420,242	591,883	223,235

Reduced incidence of hiring of *potential mothers* (young women), especially in smaller workgroups

No effect on hiring of men or women above fertile age

Inconclusive in large workgroups

Conclusion

A Firm-side perspective on parental leave

Before the reform

    Mothers who are hard to replace internally took shorter leave spells

⟩ Evidence for interplay between employers and mothers in leave-taking

Parental leave reform led women to take longer leave from their employer

With access to extended paid leave, mothers who are hard to replace internally behave more similar to other mothers

⟩ Reform seems to have distorted the interplay between employers and mothers

Workgroups affected by introduction temporary have lower employment, suggesting they are unable to fully fill gap in production line

In the longer run, employers may account for longer leave when making personnel decision

Implications

Suggestive evidence for statistical discrimination against women of fertile age, more when few internal substitutes are available (see Hensvik and Rosenqvist, 2019)

> Caveat: only for firms that were "surprised" by reform. Longer-run effects may differ once firms adjust mechanisms to replace mothers

If young women are adversely affected in hiring decisions, policy makers may look for ways to counteract

More even division of leave between mothers and fathers would reduce penalty, but lead to *potential fathers* also being affected

Alternative: Compensate firms for birth events and associated absences

Thanks for your attention and feedback!
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Size of firms
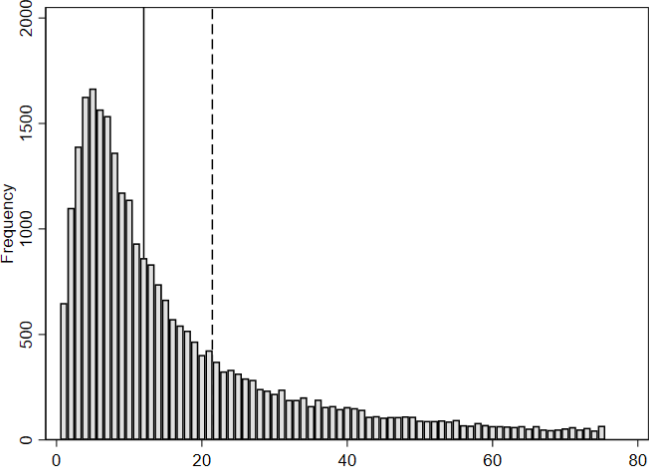
Comparison of analysis sample with excluded observations

	Analysis sample (1)	Dropped observations (first-time mothers) (2)
Individual characteristics		
Age at birth	30.00	28.50
	(4.01)	(4.81)
East Germany	0.11	0.16
	(0.31)	(0.37)
German citizen	0.96	0.92
	(0.20)	(0.27)
High education	0.39	0.32
	(0.49)	(0.47)
Monthly wage, 10 months pre-birth	2,685.41	2,109.88
	(793.35)	(1249.56)
At same firm, 10 months pre-birth	1.00	0.89
	(0.00)	(0.31)
Tenure at current firm in days	1,992.58	1,685.11
	(1396.30)	(1390.31)
Full-time employed	0.94	0.80
	(0.23)	(0.40)
Non-routine job	0.37	0.34
	(0.48)	(0.47)
Length of parental leave	779.11	847.13
	(1021.64)	(1038.59)
Days until return to pre-birth firm	1,503.81	1,609.53
	(1632.01)	(1626.15)
Pre-birth firm characteristics		
Firm size	22.39	652.22
	(26.63)	(2646.99)
Share of female employees	0.58	0.66
	(0.30)	(0.25)
Average age of full-time employees	38.81	38.24
	(5.80)	(5.45)
Median monthly wage of full-time employees	2,597.50	2,528.14
	(1010.61)	(1099.01)
Observations	26,609	319,300

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Size of workgroups
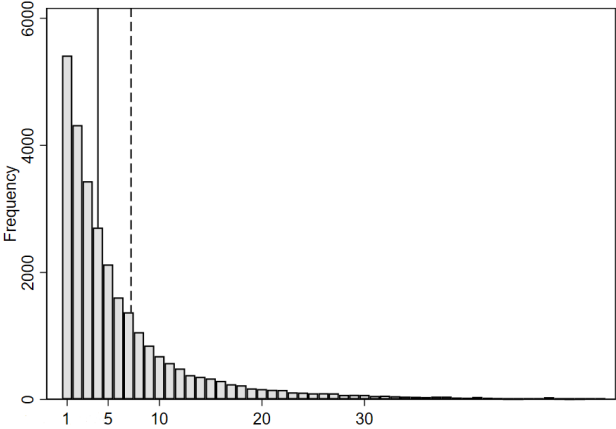
Summary statistics by replaceability

| | Workgroup with ... employees | | | |
	1-2	3-10	11+	All
Individual characteristics				
Age in years	30.30	29.83	29.94	30.01
	(3.95)	(3.98)	(4.12)	(4.00)
East Germany	0.12	0.10	0.10	0.11
	(0.33)	(0.30)	(0.31)	(0.31)
German citizenship	0.96	0.96	0.94	0.96
	(0.19)	(0.20)	(0.23)	(0.20)
High education	0.44	0.36	0.33	0.38
	(0.50)	(0.48)	(0.47)	(0.49)
Wage 18 months pre-birth	2,534.69	2,537.31	2,705.85	2,567.26
	(945.28)	(870.52)	(918.49)	(907.43)
Tenure at current firm in days	1,539.19	1,814.36	1,885.80	1,734.68
	(1282.95)	(1432.47)	(1469.93)	(1398.15)
Full-time employed	0.95	0.95	0.93	0.94
	(0.23)	(0.23)	(0.26)	(0.23)
Pre-birth firm characteristics				
Firm size	12.34	19.00	44.78	21.47
	(17.14)	(21.76)	(33.74)	(25.79)
Workgroup size	1.45	5.33	22.33	7.13
	(0.50)	(2.12)	(14.53)	(9.78)
Observations	4,420	6,295	2,399	13,114

back

Short- and long-term coefficients

Short-term: 3-14 months post-birth

Long-term: 15-54 months post-birth

$$
\begin{aligned}
y_{it} = \theta_i &+ \sum_{t=s,l} \gamma_{dt} \quad \mathbb{1}(T_t) \quad reform_i \quad spring_i + \sum_{t=s,l} \delta_{dt} \quad \mathbb{1}(T_t) \quad reform_i \\
&+ \sum_{t=s,l} \tau_{dt} \quad \mathbb{1}(T_t) \quad spring_i + \sum_{t=s,l} \beta_{dt} \quad \mathbb{1}(T_t) + u_{it}
\end{aligned}
\tag{2}
$$

Employment in workgroup

Figure: Event study coefficients by size of workgroup