

# Employer Responses to Family Leave Programs

Rita Ginja\*

Arizo Karimi†

Pengpeng Xiao‡

## Online Appendix

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\*Department of Economics, University of Bergen, Uppsala Center for Labor Studies (UCLS); IZA. rita.ginja@uib.no.

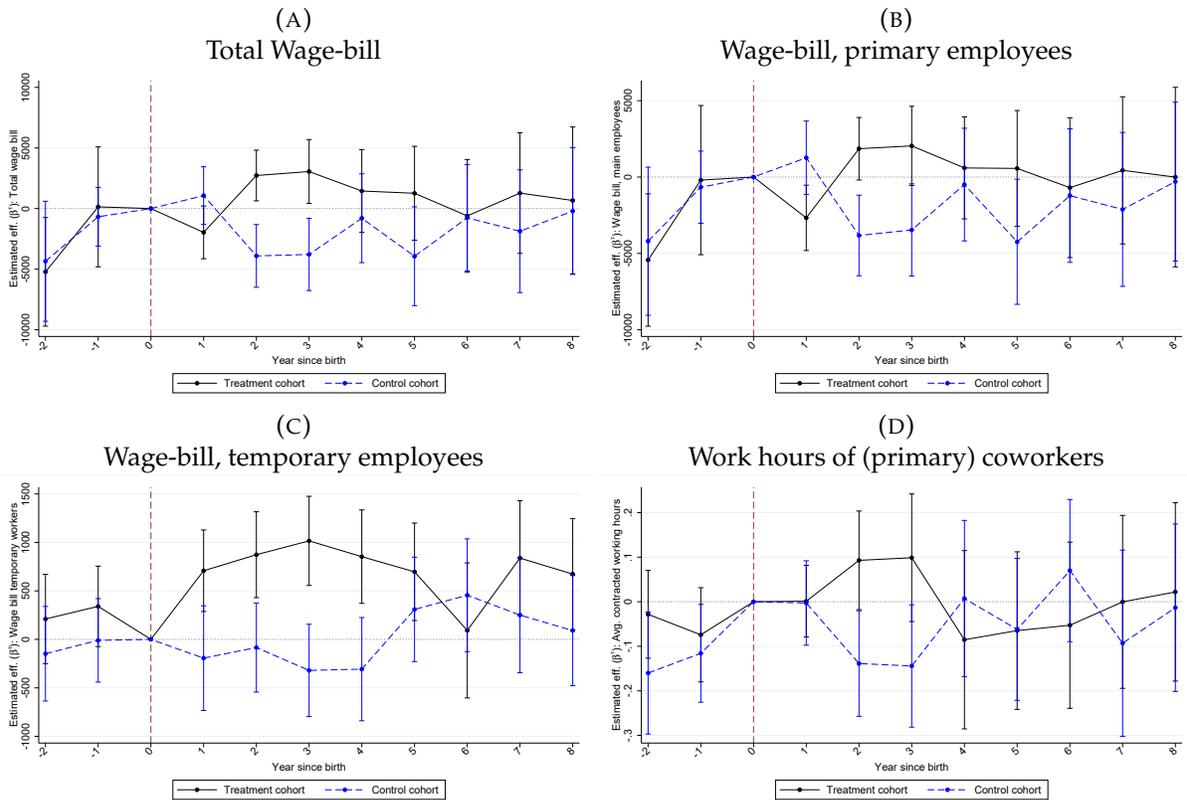
†Department of Economics, Uppsala University; Uppsala Center for Labor Studies (UCLS), and Institute for Evaluation of Labor Market and Education Policy (IFAU). arizo.karimi@nek.uu.se

‡Department of Economics, Duke University. pengpeng.xiao@duke.edu.

# A Appendix A: Additional Tables and Figures

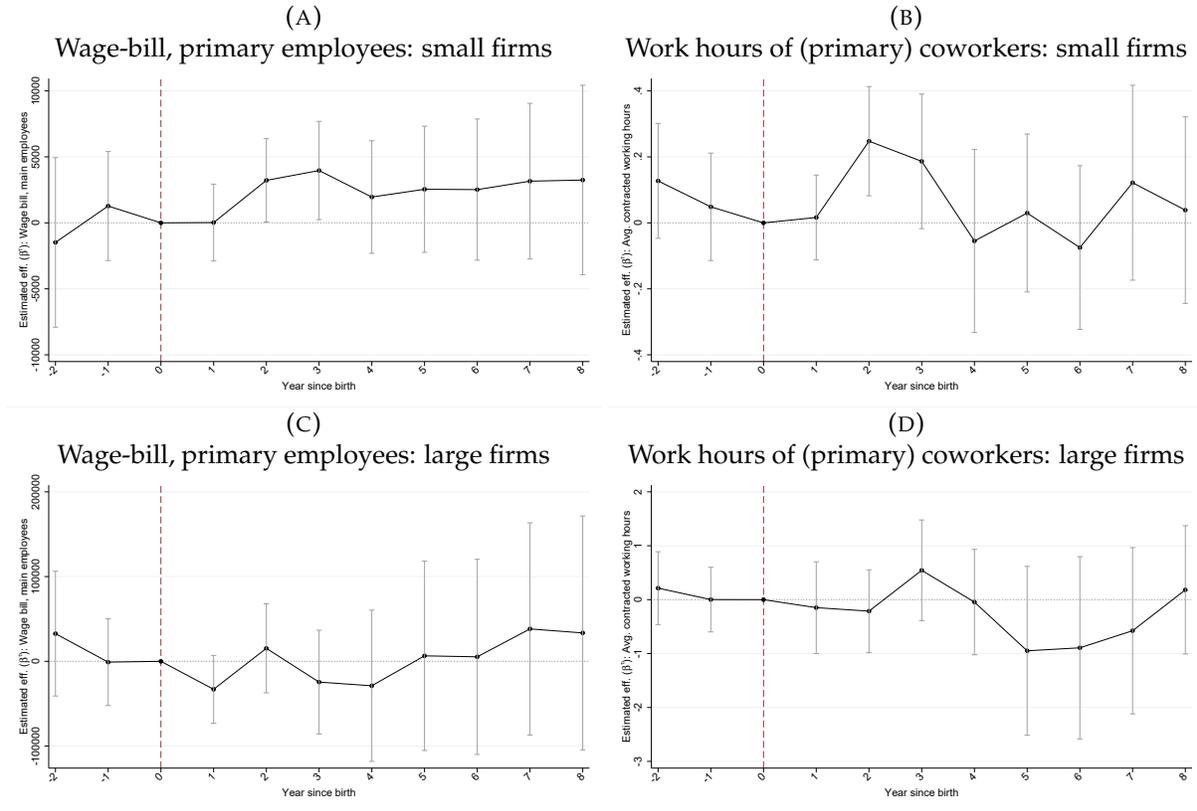
FIGURE A.1.

Employer responses by treatment- and control-cohort firms separately



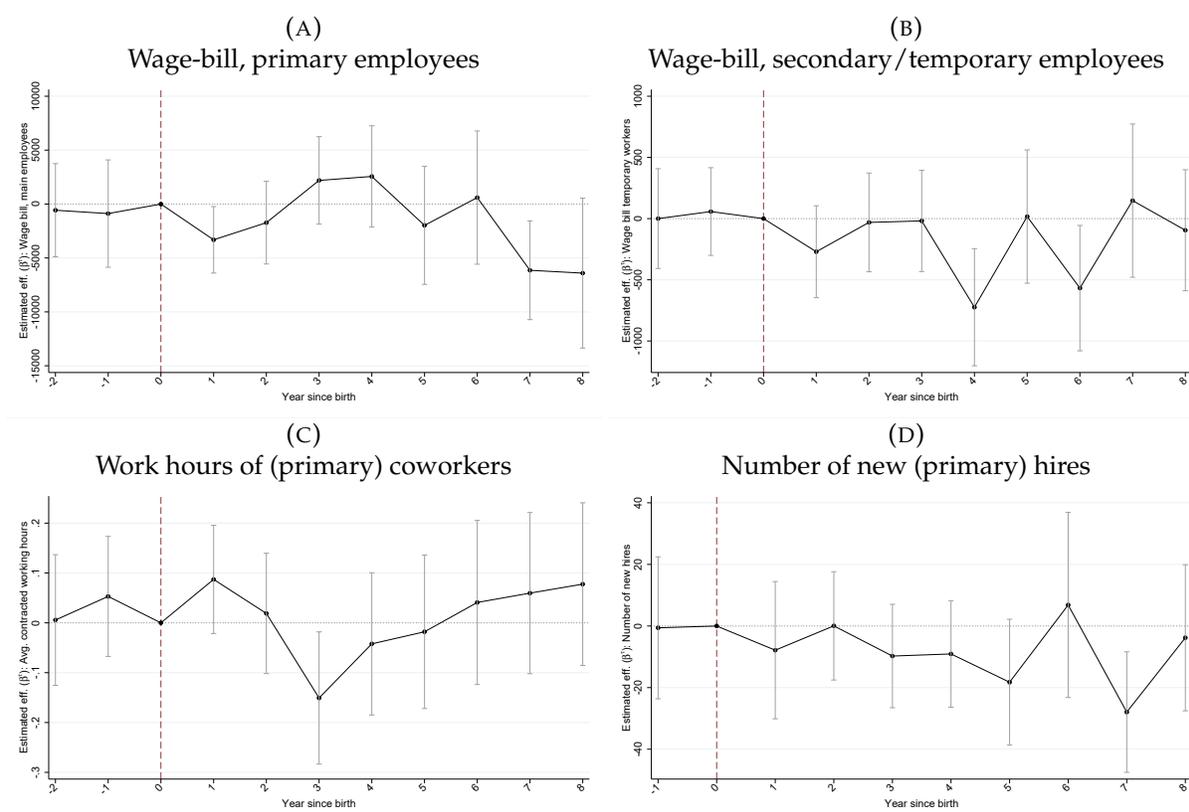
NOTE: The graph reports difference-in-differences estimates of the 1989 reform on firms' outcomes. Each point in the graph represents the coefficient on a triple interaction term consisting of an indicator for employing women who gave birth to a child in 1988 or 1987, the proportion of the workforce whose child was born in October–December (relative to January–July), and the respective event-time indicator for year since birth indicated in the  $x$ -axis. 95% confidence intervals indicated by the vertical lines. The firm's wage bill outcomes are expressed in 1000s SEK. Contracted work hours are expressed in percentages of full-time hours (40 hours per week).

FIGURE A.2.  
Heterogeneous employer responses by firm size



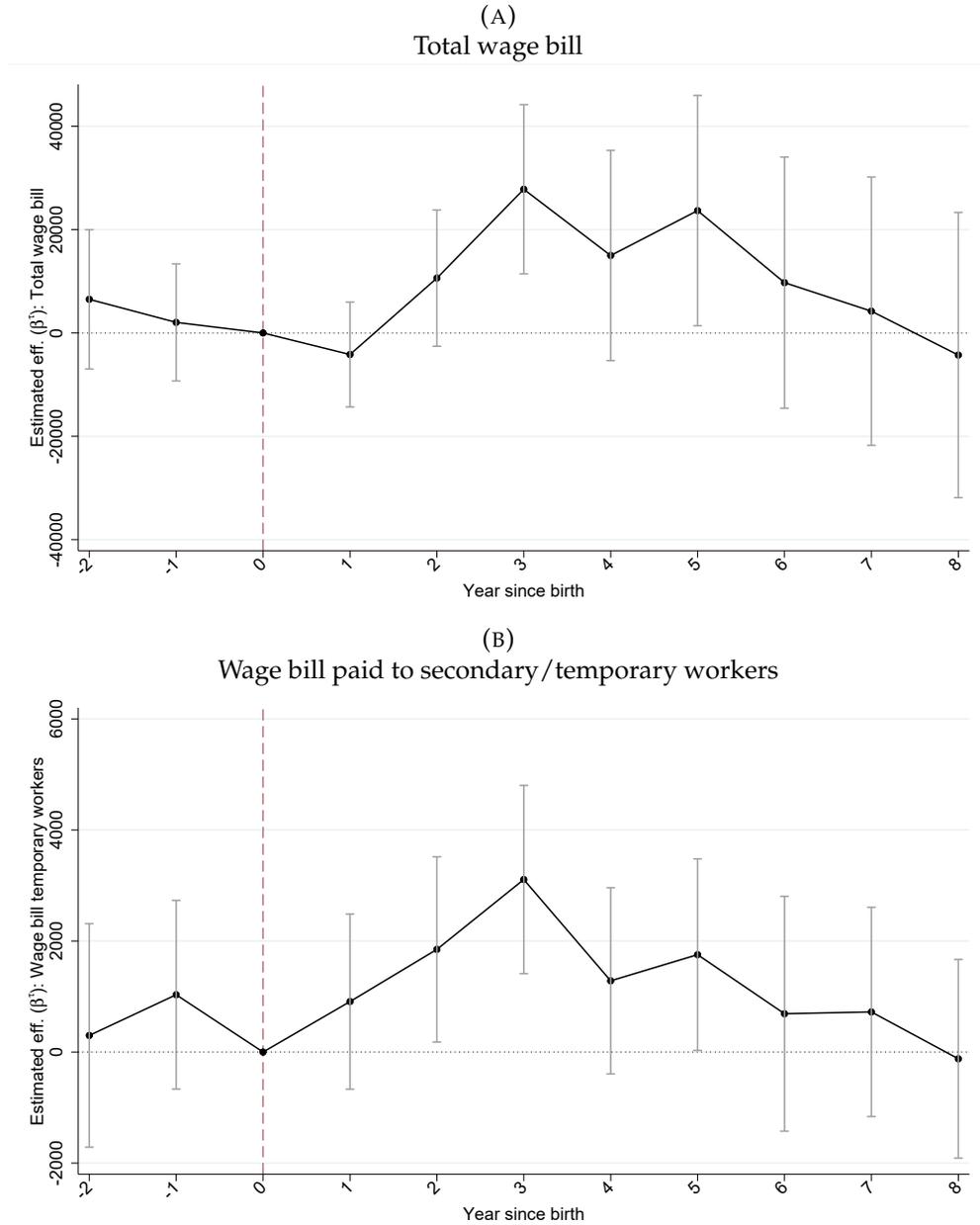
NOTE: The graph reports difference-in-differences estimates of the 1989 reform on firms' outcomes. Each point in the graph represents the coefficient on a triple interaction term consisting of an indicator for employing women who gave birth to a child in 1988 (relative to 1987), the proportion of the workforce whose child was born in October–December (relative to January–July), and the respective event-time indicator for year since birth indicated in the  $x$ -axis. Thus, the points correspond to the  $\hat{\beta}^\tau$  from Equation (2) in the paper, along with the 95% confidence intervals. The firm's wage bill outcomes are measured in 1000s SEK. Contracted work hours are expressed in percentages of full-time hours (40 hours per week).

FIGURE A.3.  
Decomposing employer responses: primary workers' hours increases or temporary replacement workers? Public sector



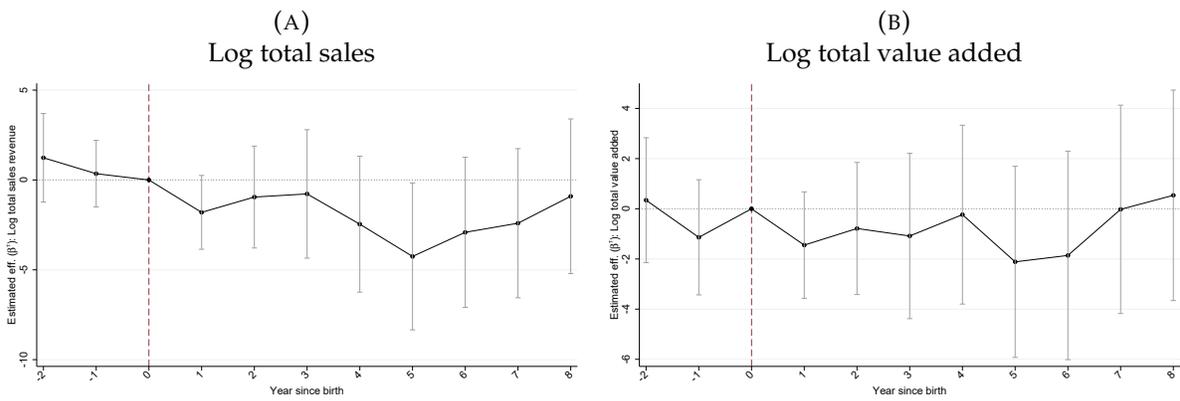
NOTES: The graph reports difference-in-differences estimates of the 1989 reform on firms' outcomes. Each point in the graph represents the coefficient on a triple interaction term consisting of an indicator for employing women who gave birth to a child in 1988 (relative to 1987), the proportion of the workforce whose child was born in October–December (relative to January–July), and the respective event-time indicator for year since birth indicated in the  $x$ -axis. Thus, the points correspond to the  $\hat{\beta}^t$  from Equation (2) in the paper, along with the 95% confidence intervals. The firm's wage bill outcomes are measured in 1000s SEK. Contracted work hours are expressed in percentages of full-time hours (40 hours per week).

FIGURE A.4.  
Effects of the reform on manufacturing firms



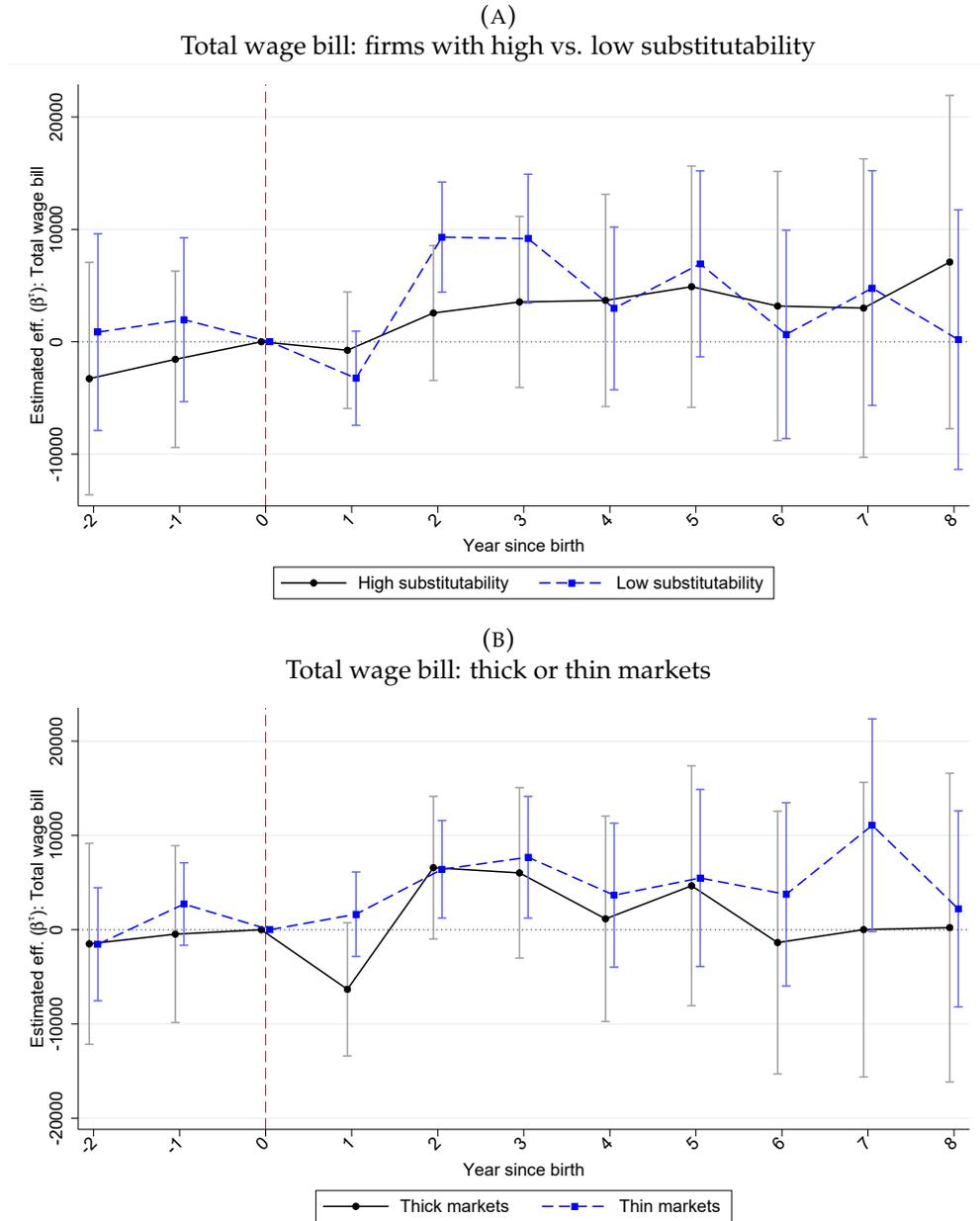
NOTES: The graph reports difference-in-differences estimates of the 1989 reform on firms' outcomes. Each point in the graph represents the coefficient on a triple interaction term consisting of an indicator for employing women who gave birth to a child in 1988 (relative to 1987), the proportion of the workforce whose child was born in October–December (relative to January–July), and the respective event-time indicator for year since birth indicated in the  $x$ -axis. Thus, the points correspond to the  $\hat{\beta}^t$  from Equation (2) in the paper, along with the 95% confidence intervals. The firms' wage bill measures are expressed in 1000s SEK.

FIGURE A.5.  
Effects of the reform on firm performances in the manufacturing sector



NOTES: The graph reports difference-in-differences estimates of the 1989 reform on firms' outcomes. Each point in the graph represents the coefficient on a triple interaction term consisting of an indicator for employing women who gave birth to a child in 1988 (relative to 1987), the proportion of the workforce whose child was born in October–December (relative to January–July), and the respective event-time indicator for year since birth indicated in the  $x$ -axis. Thus, the points correspond to the  $\hat{\beta}^\tau$  from Equation (2) in the paper, along with the 95% confidence intervals. The firm's revenues and value added measures are expressed in 1000s SEK.

FIGURE A.6.  
Heterogeneity in total wage bill costs by external and internal labor market conditions



NOTE: The graph reports difference-in-differences estimates of the 1989 reform on firms' outcomes. Each point in the graph represents the coefficient on a triple interaction term consisting of an indicator for employing women who gave birth to a child in 1988 (relative to 1987), the proportion of the workforce whose child was born in October–December (relative to January–July), and the respective event-time indicator for year since birth indicated in the  $x$ -axis. Thus, the points correspond to the  $\hat{\beta}^\tau$  from Equation (2) in the paper, along with the 95% confidence intervals. The firm's wage bill is measured in 1000s SEK.

TABLE A.1.  
Summary statistics: Workers' pre-determined characteristics (by treatment status)

	Control cohort (1987)		Treatment cohort (1988)				DD	
	(1) Jan-July	(2) Oct-Dec	(3) <i>t</i> -stat (1)-(2)	(4) Jan-July	(5) Oct-Dec	(6) <i>t</i> -stat (4)-(5)	(7) DD est. (6)-(3)	(8) <i>t</i> -stat (6)-(3)
Age	28.713	28.149	-13.659	28.602	28.110	-12.318	0.073	1.263
No college	0.737	0.749	3.036	0.746	0.751	1.554	-0.006	-1.118
College	0.263	0.251	-3.036	0.254	0.249	-1.554	0.006	1.118
Labor income (1000s SEK)	117.991	114.897	-5.935	119.506	116.935	-4.944	0.524	0.710
Monthly wage rate (1000s SEK)	15.743	15.738	-0.120	16.386	16.343	-0.979	-0.038	-0.624
Contracted work hours	0.846	0.838	-2.705	0.846	0.850	1.413	0.013	2.939
Private sector	0.336	0.352	4.008	0.356	0.374	4.533	0.002	0.303
Child parity	1.821	1.804	-2.207	1.823	1.807	-2.124	0.001	0.102
Child spacing	28.595	28.075	-1.669	27.655	27.165	-1.674	0.030	0.071
Observations	56,423	19,918		60,147	21,322			157,810

NOTE: The sample includes women who gave birth in 1987 and 1988, who earned at least SEK 10,000 in the calendar year prior to birth, who did not give birth in the months of August or September, and employed at workplaces with at least 10 employees.

TABLE A.2.  
Summary statistics for all firms & organizations active in Sweden, and for firms in study sample

	All workplaces		Sample workplaces	
	Mean	St. dev.	Mean	St. dev.
Private sector	1.000	0.000	1.000	0.000
Tradable industry	0.265	0.441	0.253	0.435
Share female	0.376	0.279	0.508	0.258
Number of births	0.550	1.287	1.469	1.030
Share compulsory schooling	0.419	0.208	0.415	0.210
Share with high school	0.479	0.167	0.468	0.159
Share workers with some college	0.057	0.087	0.059	0.088
Share workers with college	0.045	0.102	0.057	0.113
Workplace size	38.272	52.492	51.878	60.015
Average age	35.771	5.866	35.389	5.765
Average contracted working hours	0.952	0.079	0.957	0.066
Female work hours	0.905	0.127	0.920	0.107
Male work hours	0.984	0.042	0.983	0.036
Average wage (SEK)	20,379.123	4,333.787	19,870.196	4,259.624
Female wage (SEK)	17,813.575	2,875.785	17,491.812	2,797.317
Male wage (SEK)	22,519.354	5,567.416	22,271.492	5,586.942
Female income (SEK)	130,028.531	56,747.952	125,349.689	50,293.489
Observations	39,159		16,942	

NOTE: Columns (1) and (2) report the means and standard deviations, respectively, for all private sector firms active in Sweden in 1988, and the characteristics are measured in 1988. Columns (3) and (4) report the means and standard deviations of characteristics for the workplaces in our sample, which consists of establishments that employ at least one woman in 1988 (treatment year) or 1987 (control year), and who employ at least 10 people in the baseline year. The characteristics for the study sample of firms are measured in the baseline year of the respective cohorts, i.e., in year 1988 for the treatment firms and in 1987 for the control group firms.

TABLE A.3.  
Industry mix for all private sector firms & organizations active in Sweden, and for firms in study sample

	All workplaces		Sample workplaces	
	# of workplaces	% workplaces	# of workplaces	% workplaces
Armed forces	1,598	4.081	770	4.545
Agriculture, hunting, forestry	671	1.714	244	1.440
Fishing	14	0.036	1	0.006
Mining and quarrying	139	0.355	35	0.207
Manufacturing	9,306	23.765	3,948	23.303
Electricity, gas and water	265	0.677	53	0.313
Construction	4,018	10.261	455	2.686
Wholesale and retail trade etc.	10,445	26.673	4,991	29.459
Hotels and restaurants	2,230	5.695	1,269	7.490
Transport and communications	2,187	5.585	653	3.854
Financial intermediation	1,345	3.435	825	4.870
Real estate, renting, other	730	1.864	281	1.659
Data management operations	509	1.300	248	1.464
R&D	91	0.232	50	0.295
Other business activities	2,713	6.928	1,365	8.057
Public adm., defense, social insurance	34	0.087	23	0.136
Education	774	1.977	455	2.686
Health and social work	642	1.639	438	2.585
Lobbying, and religious activities	591	1.509	363	2.143
Recreation, culture, sports	857	2.189	475	2.804
Total	39,159	100	16,942	100

NOTE: Columns (1) and (2) report the industry composition for all firms active in Sweden in 1988. Columns (3) and (4) report industry composition for the workplaces in our sample, which consists of establishments that employ at least one woman in 1988 (treatment year) or 1987 (placebo year).

TABLE A.4.

Summary statistics: Firms' pre-determined characteristics (by treatment status). Sample: firms with 10-20 employees, and only 1 woman giving birth in the baseline year

	Control cohort (1987)			Treatment cohort (1988)			DD	
	(1) Jan-July	(2) Oct-Dec	(3) <i>t</i> -stat (1)-(2)	(4) Jan-July	(5) Oct-Dec	(6) <i>t</i> -stat (4)-(5)	(7) DD (6)-(3)	(8) <i>t</i> -stat for (6)-(3)
Number of workers	14,332	14,245	-0.614	14,110	14,229	0.890	0.205	1.058
Number of female workers	8,265	8,196	-0.390	8,057	8,180	0.736	0.192	0.790
Number of male workers	6,066	6,049	-0.097	6,053	6,049	-0.025	0.013	0.053
Number women aged 20-40	3,603	3,558	-0.410	3,493	3,508	0.150	0.061	0.400
Private sector	1,000	1,000	.	1,000	1,000	.	0.000	
Average age	35.301	34.637	-2.397	35.180	34.906	-1.008	0.389	1.001
Share female	0.548	0.548	0.024	0.541	0.546	0.414	0.004	0.268
Average monthly wage (SEK)	19,000	19,000	0.479	19,000	19,000	-0.762	-373.664	-0.872
Average female monthly wage (SEK)	17,000	17,000	-0.114	17,000	17,000	-0.766	-138.671	-0.451
Average male monthly wage (SEK)	21,000	22,000	0.889	22,000	21,000	-1.526	-1216.215	-1.690
Female contracted work hours	0.924	0.933	0.957	0.928	0.927	-0.100	-0.010	-0.768
Male contracted work hours	0.983	0.983	0.225	0.983	0.980	-1.055	-0.004	-0.896
Wage bill, primary employees (1000s SEK)	2,100	2,100	0.671	2,100	2,100	-0.323	-49.095	-0.703
Wage bill, temporary workers (1000s SEK)	188,094	182,024	-0.395	225,762	196,467	-0.999	-23.225	-0.681
Share no college	0.888	0.879	-1.114	0.876	0.887	1.481	0.020	1.831
Share college	0.112	0.121	1.114	0.124	0.113	-1.481	-0.020	-1.831
Observations	1,795	693		2,057	738		5,283	

NOTE: The sample includes firms with 10-20 employees in the baseline year, out of which exactly 1 woman gave birth.

TABLE A.5.  
Summary statistics: Outcomes measured at baseline

	Control cohort firms		Treatment cohort firms	
	Mean	St. dev.	Mean	St. dev.
<i>A. 1989 Parental leave reform</i>				
Workplace size (baseline)	48.211	48.782	45.777	47.060
Treatment intensity	0.014	0.026	0.015	0.026
Total wage bill	8,404.233	10,040.273	8,129.206	9,880.869
Primary wage bill	7,885.682	9,684.447	7,594.799	9,507.498
Temp wage bill	518.551	1,060.874	534.407	1,085.466
Incumbent work hours	0.956	0.066	0.958	0.068
Incumbent wage rate	19,595.939	4,158.014	20,014.637	4,355.868
Observations	7,981		8,653	
<i>B. 2002 Parental leave reform</i>				
Workplace size (baseline)	41.617	45.715	41.507	45.217
Treatment intensity	0.040	0.045	0.041	0.057
Total wage bill	10,648.752	15,144.021	10,574.714	15,132.143
Primary wage bill	10,099.867	14,590.433	10,077.973	14,625.689
Temp wage bill	548.885	1,121.389	496.741	1,147.250
Incumbent work hours	0.938	0.094	0.932	0.104
Incumbent wage rate	25,810.276	6,542.024	26,195.403	7,013.286
Observations	27,369		28,070	

NOTE: The sample includes private sector firms, and the characteristics/outcomes displayed in the table are measured at baseline ( $\tau = -1$ ).

TABLE A.6.  
 Summary statistics for the subset of firms with observations on sales revenue and value added measures

	Mean	St. dev.
Tradable industry	0.955	0.207
Share female	0.367	0.225
Number of births	1.597	1.136
Share compulsory schooling	0.505	0.159
Share with high school	0.433	0.130
Share workers with some college	0.043	0.053
Share workers with college	0.019	0.040
Workplace size	66.360	60.783
Average age	36.293	4.544
Avg contracted working hours	0.946	0.069
Female work hours	0.875	0.123
Male work hours	0.989	0.033
Average wage (SEK)	21,319.263	3,183.627
Female wage (SEK)	17,729.804	2,328.726
Male wage (SEK)	23,644.864	3,657.964
Female income (SEK)	127,447.761	34,754.587
Male income (SEK)	188,687.291	45,187.852
Sales per worker	972.596	878.751
Value added per worker	446.618	301.853
Observations	2,924	

NOTE: Columns (1) and (2) report the means and standard deviations, respectively, for the subset of private sector firms in our sample that are included in the register data covering firms' balance sheet information. Characteristics displayed are measured at baseline.

## B Appendix B: Parental Leave Benefit Take-up

Our auxiliary data on parental leave benefits covers the universe of leave spells (start- and end-dates) at the individual level, but are subject to a few caveats. First, data on leave spells start in 1988. Second, leave spells recorded before 1994 only contains identifiers only for the parents, not for the child for whom the leave is taken. Because of these limitations, we sample workers to *first-born* children in 1988 and 1989. Looking at take-up after the first child is born implies that we are unlikely to confound parental leave spells for multiple children in the household. Under the assumption that the reform did not affect subsequent fertility, we can interpret the medium-run potential differences in take-up between the treated and untreated cohorts as a direct reform effect.<sup>1</sup> Second, since we lack data on take-up before 1988, parents to kids born in 1989 will serve as the control group. While all parents of the latter group are treated, there should be no difference in the leave take-up between those who give birth in different calendar months within 1989. Let  $T_i$  be an indicator that takes the value 1 if individual  $i$ 's child was born in October–December, and zero if her child was born in January–July. Let  $D_i$  take the value 1 for workers whose child was born in 1988, and 0 for those whose child was born in 1989, and let  $s$  denote the age of individual  $i$ 's first child in months. We estimate the following regression specification by OLS:

$$y_{ia} = \delta_0 + \beta_a(T_i \cdot D_i) + \delta_1 T_i + \delta_2 D_i + v_{ia} \quad (1)$$

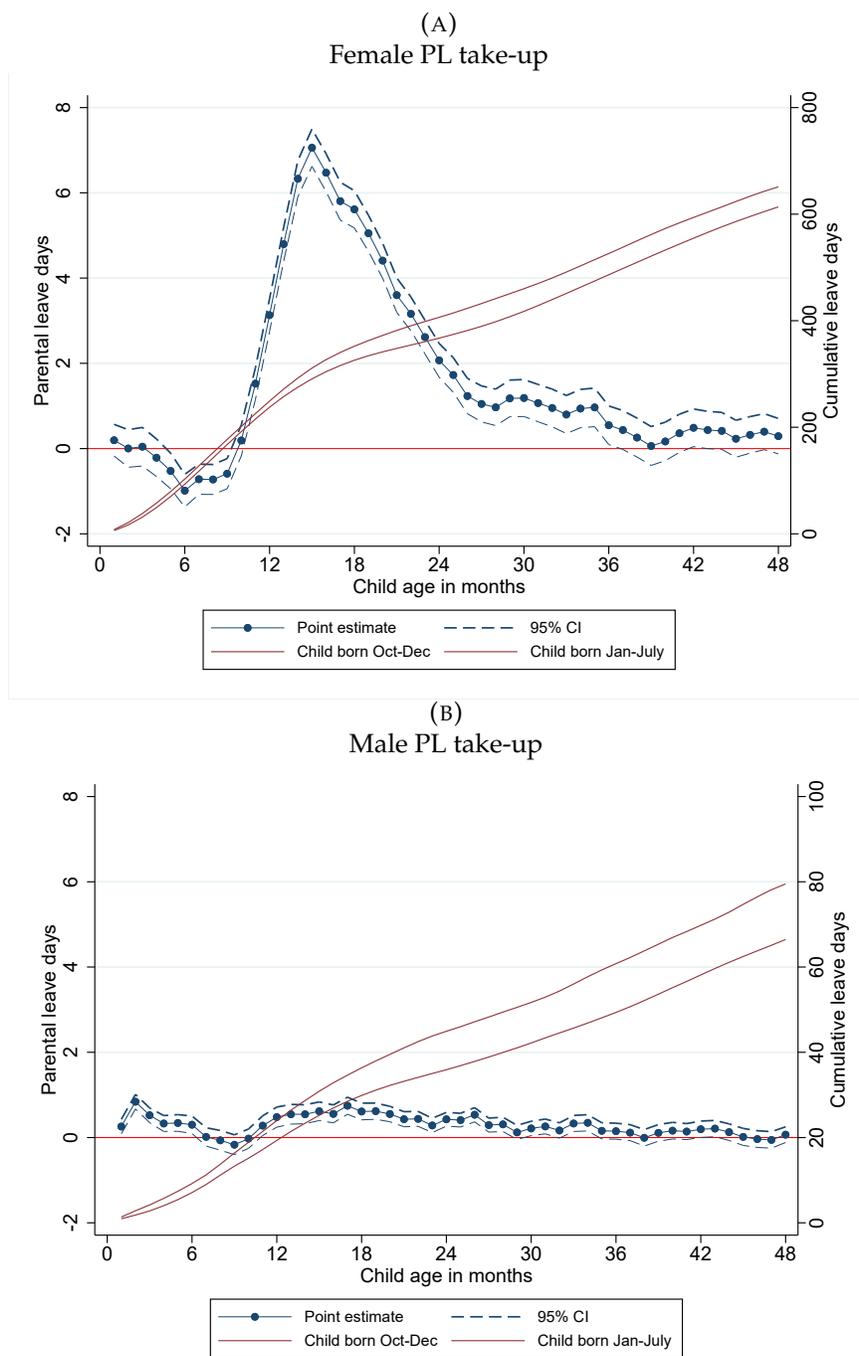
We estimate (1) on the number of (gross)<sup>2</sup> days on leave separately for each month after the birth of  $i$ 's first child. Panel A of Figure B.1 plots the estimated coefficients  $\hat{\beta}_a$ 's from equation (1) for women. The results show that women used most of the additional leave during the child's second year of life, but leave days also increased during year three. In Panel B of Figure B.1 we show that some of the additional leave was also taken-up by fathers, but considerably less than among women. In Table B.1 we present estimates of the effect of the reform on take-up pooled over the first four years of the child's life, separately by gender and sector of employment. We find that eligible women increased their leave take-up by 78 days on average, while eligible male workers increased leave-taking by 8 days, on average. Thus, the reform had full impact on take-up. Moreover, we conclude that there is virtually no difference in the effect of the reform on female take-up by sector of employment, but that male public sector workers made more use of the additional leave relative to male private sector workers.

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<sup>1</sup>In Table B.2 we report results from estimating a difference-in-difference model comparing the completed fertility of women that are eligible to the additional three months of leave to that of non-eligible mothers, netting out seasonality in the outcome variable by birth month using the sample of individuals with a child born in 1987. We find no evidence suggesting that the reform affected subsequent fertility.

<sup>2</sup>Benefit can be collected on a part-time basis, e.g., 50 percent of a day. We do not have information on the intensity of benefit usage, so we are unable to calculate net benefit days.

FIGURE B.1.  
Effects of the 1989 reform on the take-up of parental leave



NOTE: The graph reports difference-in-differences estimates of the 1989 parental leave reform on take-up. Each point in the graph represents the coefficient on an interaction term between having a child born in October–December (relative to January–July), and an indicator between having a child in 1988 (relative to 1989), estimated separately for each month since the child was born. Thus, the points correspond to the estimated coefficients  $\beta_a$  from equation (1), which capture the difference in parental leave take-up between workers giving birth in October–December and January–July 1988, net of the corresponding difference among workers whose child was born in 1989. 95% confidence intervals are indicated with dashed lines. The right-hand-side  $y$ -axis shows the cumulative distribution function of leave take-up among parents to children born in the first- and second half of 1988.

TABLE B.1.  
Effects of the 1989-reform on parental leave take-up days, by gender and sector of employment

	(1)	(2)	(3)
	All	Private	Public
<b>A. Female take-up</b>			
$D_i \times T_i$	77.497*** (5.707)	77.704*** (9.156)	73.323*** (7.680)
<b>B. Male take-up</b>			
$D_i \times T_i$	7.982*** (2.432)	5.856** (2.737)	16.718*** (5.109)
Observations	50,052	34,017	13,760

NOTE: The table reports the estimated coefficient  $\beta_a$  from equation (1) where the outcome measures the total days of parental leave benefit take-up until the child's eighth birthday (full period during which leave can be used). The estimation includes flexible controls for age, educational level measured in the year that  $i$  gives birth (compulsory schooling, high school, some college, and college degree), and the average earnings in the two years before giving birth. Robust standard errors in parentheses.

TABLE B.2.  
Effects of the 1989-reform on completed fertility

	All	Private sector	Public sector
$D_i \times T_i$	0.001 (0.015)	0.010 (0.023)	0.013 (0.020)
Observations	78,423	29,734	41,049

NOTE: The sample includes women who gave birth in 1987 and 1988, who earned at least SEK 10,000 in the calendar year prior to birth, and who did not give birth in the months of August or September. The outcome variable measures the total number of children born to a person by year 2017. The table reports estimates of  $\hat{\beta}$  from the following equation:

$$y_i = \delta_0 + \beta(T_i \times D_i) + \delta_1 T_i + \delta_2 D_i + \mathbf{X}_i' \gamma + \epsilon_i$$

where  $T_i$  is an indicator that takes the value 1 if person  $i$  had a child born in October–December and 0 if person  $i$ 's child was born in January–July. Robust standard errors in parentheses.

TABLE B.3.  
Effects of the 2002 reform on male's parental leave take-up days by sector of employment

	First year	Second year	Third year	Years 1-3
Private sector workers				
Coefficient	7.915	22.139	3.035	26.037
<i>t</i> -statistic	2.774	4.505	1.578	4.238
SE	2.853	4.914	1.924	6.144
Mean	21.242	58.179	16.907	75.329
% Effect	0.373	0.381	0.180	0.346
<i>N</i>	59,810	59,810	59,810	59,810
Public sector workers				
Coefficient	6.956	21.847	7.383	29.440
<i>t</i> -statistic	1.541	1.974	1.398	2.155
SE	4.513	11.065	5.282	13.662
Mean	21.242	58.179	16.907	75.329
% Effect	0.327	0.376	0.437	0.391
<i>N</i>	11,892	11,892	11,892	11,892

NOTE: The table reports the regression discontinuity estimate of the effect of the 2002 parental leave reform on fathers' parental leave take-up. Estimated using the `rdrobust` syntax in Stata.