

The Effects of Co-worker Absenteeism on Labour Market Outcomes: Evidence from Brazil

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[\(Link to PPT\)](#)

Motivation

- Social interactions in the workplace are an important determinant of worker effort and firm productivity (Lazear, 1989; Rotemberg, 1994).
- Defining, measuring, and estimating the effects of such interactions is not easy.
 - The literature on the topic relies on case studies (Hesselius, et al., 2009).
- This paper: I analyse how the absence of a co-worker can affect other workers in the firm.

Introduction

- **Research question:** How does the absence of a co-worker affect the remaining workers in the workplace?
- **Setup:** Brazilian policy that allowed firms to offer extended maternity leave (EML) to their workers (from four to six months).
- **Empirical strategy:** IV framework that uses the eligibility of co-workers as an instrument for their take-up decision.
- **Results:**
 - **Step 1:** Estimate the causal effects of co-worker's absenteeism on labour market outcomes.
 - **Step 2:** Analyse how the exposure to this policy affects other workers in the firm.
 - **Step 3:** Estimate the effects of the policy's adoption on the firms.

Preview of results

- **Causal effects:** Positive effects of co-worker's absenteeism on wages, retention, and promotion prospects.
- **Other workers in the workplace:** All workers benefit from having an absent co-worker.
 - Wages, probabilities of separation, layoffs, and promotions.
 - These effects are stronger for men.
- **Firm:** Significant effects in the firm's sex and average wages.
 - 10% decrease in the proportion of women in high-skill positions;
 - 3% decrease in average female wages.
 - Effects driven by promotions.

Institutional background (1): Mandatory leave

- Maternity leave in Brazil has been a constitutional right since 1988.
 - Eligibility: be employed at the time of pregnancy.
 - Entitlements: 100% of wage replacement (for **four months**) if the salary is below 6,433.57 BRL (95% of female workers in the country).
- Maternity payments are **funded** by the **Brazilian Social Security System** (INSS).
- Empirical fact: virtually **all workers use four months of ML.**

Take-up

Institutional background (2): Voluntary leave

- In 2010, *Programa Empresa Cidadã* (**PEC**, or Citizen Company Program) was introduced.
 - It allows workers to *request* two additional months of ML, increasing the benefit *from four to six months*.
 - To participate, *firms* need to *opt in* (no cost).
 - The firm pays the additional leave and is refunded with a *tax rebate* by the end of the fiscal year.
 - Only firms *taxed* on their *real profits* are *eligible* for this rebate.

Take-up

- RAIS: a matched employer-employee dataset that covers the universe of formal employment in Brazil. Records from 2003 to 2019. RAIS 2015
 - Information on maternity leave spells 2007-2019. Sample selection: private-sector workers in eligible firms.
- PEC's adoption at the firm level. Staggered adoption
- *Receita Federal* (Brazilian tax authority) data on the firm's tax scheme to determine eligibility. Matching

Empirical framework: causal effects of co-workers' absenteeism.

Target worker i : a worker employed in firm that introduced PEC in the year of adoption ($k = 0$).

Sample restrictions:

- Employed for at least two years.



Co-workers (C_i): workers with the same 4-digit occupation as i in $k = 0$.



Occupation

Formal definition

Ideal experiment

Empirical framework: causal effects of co-workers' absenteeism.

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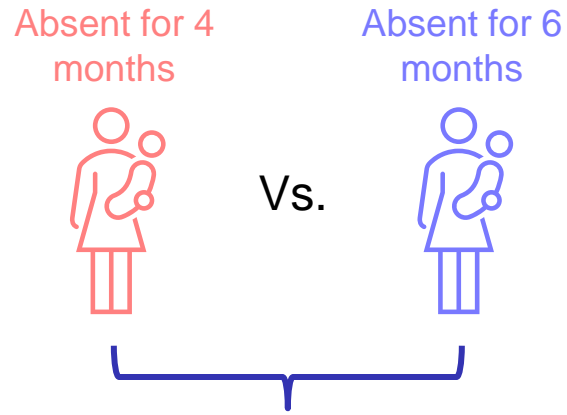
- Employed for at least two years.



Co-workers (C_i): workers with the same 4-digit occupation as i in $k = 0$.



Experiment:



Effects of having a co-worker absent for extra 2 months:
Absenteeism Effects

Occupation

Formal definition

Ideal experiment

Empirical framework: causal effects of co-workers' absenteeism.

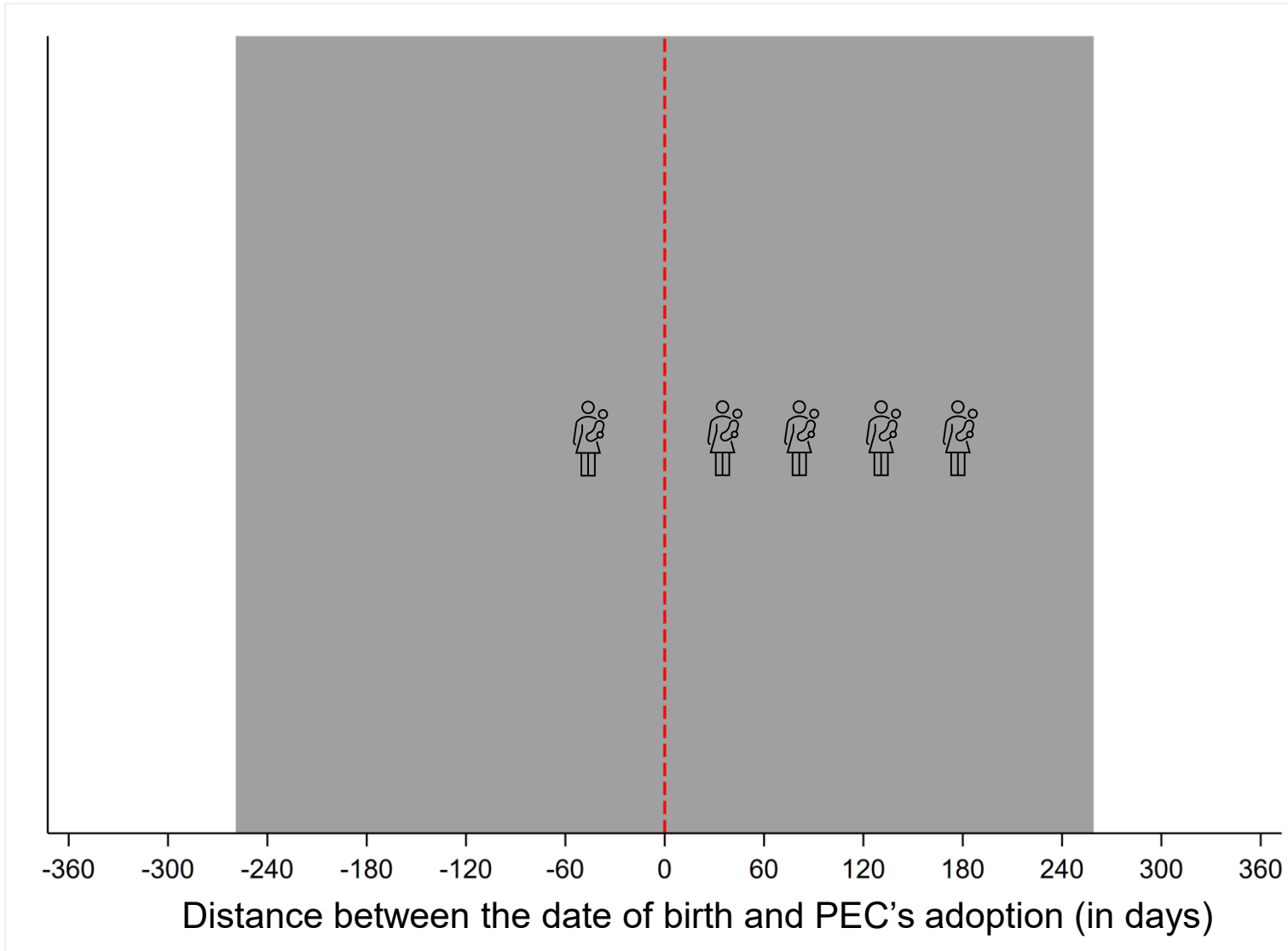
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Sample restrictions:

- Employed for at least two years.
- Have at least one co-worker giving birth in the period ($|M_i| \geq 1$).



Co-workers (C_i): workers with the same 4-digit occupation as i in $k = 0$.



Target mother: a co-worker mothering a child in the 18-month window around PEC's adoption ($M_i \subseteq C_i$).

Occupation

Formal definition

Ideal experiment

Empirical framework: causal effects of co-workers' absenteeism.

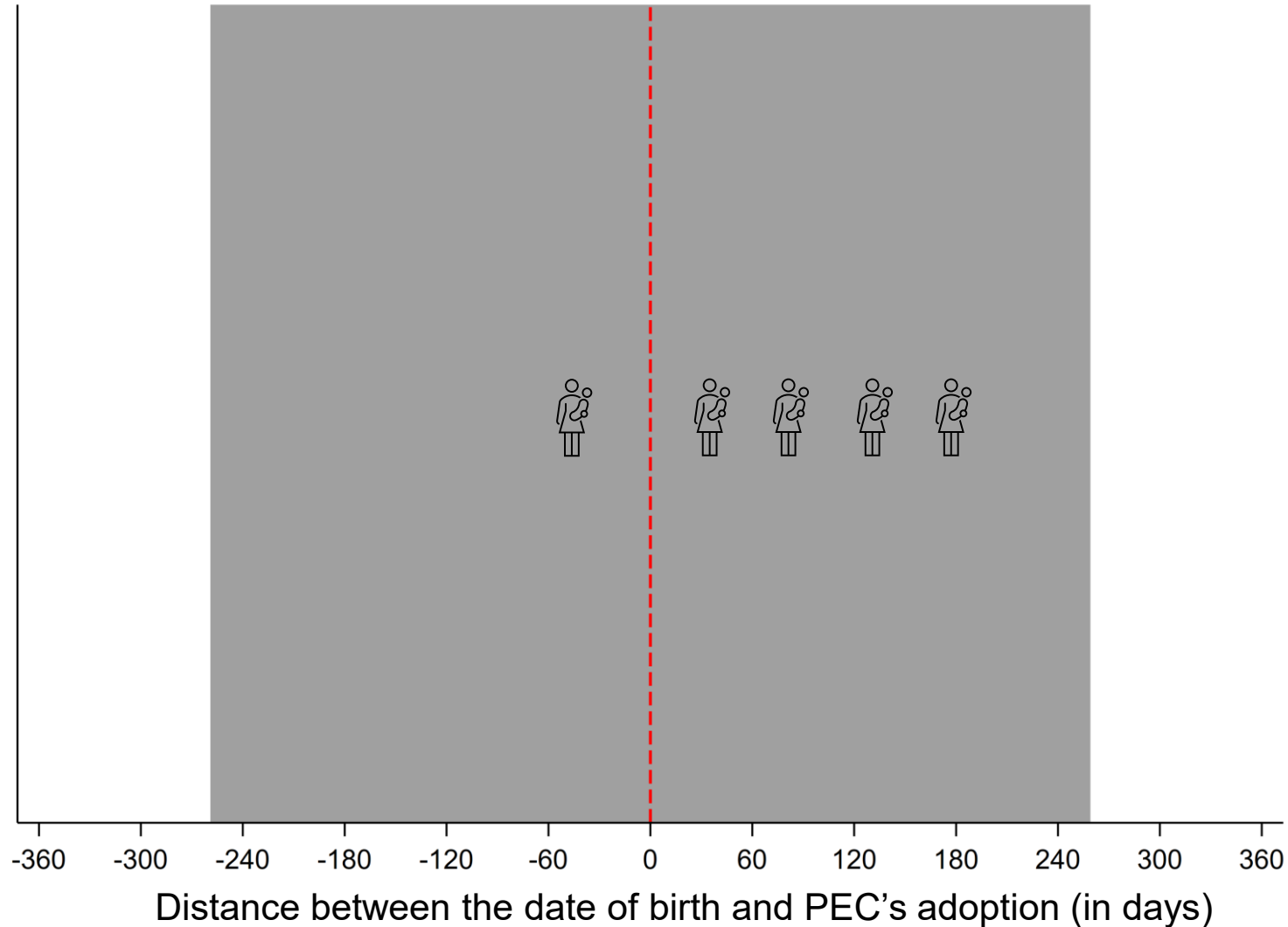
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Sample restrictions:

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Target mother: a co-worker mothering a child in the 18-month window around PEC's adoption ($\mathbb{M}_i \subseteq \mathbb{C}_i$).

Identification hypothesis:

The **position** of each target mother in this timeline is **orthogonal** to the **target worker**.

Occupation

Formal definition

Ideal experiment

Empirical specification: OLS

- The equation to be estimated is:

$$y_{it} = \gamma_i + \beta Post_{k(it)} \times \mathbf{a}_i + \theta_{k(it)} + X'_{it}\Gamma + \varepsilon_{it}$$

- y_{it} is a measure of log-wages for target worker i in year t .
- The main explanatory variable is a_i : the share of i 's co-workers **using** extended maternity leave ($EML_{i'} = 1$):

$$a_i = \frac{\sum_{i' \in \mathbb{M}_i} \mathbf{1}(EML_{i'} = 1)}{|\mathbb{M}_i|} = \frac{\text{Number of co-workers using extended ML}}{\text{Total number of co-workers on ML}}$$

Dynamic
specification

OLS effects

Effects on other
leaves

Empirical specification: OLS (2)

- The equation to be estimated is:

$$y_{it} = \gamma_i + \beta Post_{k(it)} \times \mathbf{a}_i + \theta_{k(it)} + X'_{it}\Gamma + \varepsilon_{it}$$

- γ_i are individual fixed-effects.
- $\theta_{k(it)}$ are years-since-exposure fixed-effects.
- $Post_{k(it)} = 1(k \geq 0)$ denotes post-birth observations.
- X'_{it} is a set of time-varying covariates at the worker and workplace level (age polynomials, industry, team's size).
- All regressions have standard-errors clustered at the establishment level.

Empirical specification: IV

- Instrument for a_i : the share of co-workers who are **eligible** to PEC.

$$z_i = \frac{\sum_{i' \in \mathbb{C}_i} \mathbf{1}(DoB_{i'} \geq DoA_{i'(j)})}{|\mathbb{M}_i|} = \frac{\text{Number of co-workers eligible to PEC}}{\text{Total number of co-workers on ML}}$$

- Validity:
 - Relevance: The **eligibility** of co-workers **predicts** their take-up.
 - Exclusion: The **eligibility** of co-workers is **orthogonal** to the target worker.

Variation

Balance

Pre-trends

Relevance

Exclusion

Effects on other
leaves

Empirical specification: LATE effects

$$y_{it} = \gamma_i + \beta Post_{k(it)} \times a_i + \theta_{k(it)} + X'_{it}\Gamma + \varepsilon_{it}$$

- OLS

- Variation in a_i driven by the adoption of the policy and the endogenous choice of co-workers to use extended ML.
- Effects on the average target worker in the sample.
- Reduced form (ITT): Variation from co-workers' eligibility (exogenous).

- IV

- Variation in a_i driven by the adoption of the policy only.
- Effects on the marginal target worker who had a_i shifted because of z_i (LATE theorem).

Positive effects of co-worker's absenteeism on wages

Table 4: Effects of co-workers' absenteeism on target workers' log wages.

	(1)	(2)	(3)
Panel I - OLS			
Post × Share of absent co-workers (<i>a</i>)	0.061*** (0.006)	0.055*** (0.007)	0.012*** (0.006)
Panel II - Intent to Treat (ITT)			
Post × Share of eligible co-workers (<i>z</i>)	0.014* (0.008)	0.015** (0.007)	0.016*** (0.007)
Panel III - IV			
Post × <i>a</i>	0.037* (0.020)	0.040** (0.020)	0.044** (0.018)
Event-year by year of birth FE		X	X
Individual covariates			X
Number of observations	3,815,334		

Notes: This table reports equation's 3 estimates based on a panel of target workers observed three years before and five years after the year PEC was implemented in their firms. The variable *a* denotes the share of co-workers who used extended maternity leave. The instrument *z* measures the share of co-workers eligible for PEC. The variable *Post* is an indicator to denote observations that happen after the adoption of the program. Standard errors clustered at the firm level.

$0.044 \times \overbrace{0.25}^{1 \text{ SD}}$
 =
1.1%
 The average increase in wages of a target worker facing a 1 SD increase in the share of absent co-workers.

Positive effects of co-worker's absenteeism on wages

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Panel III - IV			
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Event-year by year of birth FE		X	X
Individual covariates			X
Number of observations	3,815,334		

$0.016 \times \overbrace{0.45}^{1 \text{ SD}}$
 =
0.72%
 The average increase in wages of a target worker facing a 1 SD increase in the share of co-workers eligible for PEC.

Notes: This table reports equation's 3 estimates based on a panel of target workers observed three years before and five years after the year PEC was implemented in their firms. The variable *a* denotes the share of co-workers who used extended maternity leave. The instrument *z* measures the share of co-workers eligible for PEC. The variable *Post* is an indicator to denote observations that happen after the adoption of the program. Standard errors clustered at the firm level.

Additional results

- Robustness. [Go](#)
- Placebo. [Go](#)
- Heterogeneity across different workplaces. [Go](#)
- Heterogeneity by sex. [Go](#)
- Separations, layoffs and promotions. [Go](#)
- Exposure. [Go](#)
- Take-up. [Go](#)
- Spillovers. [Go](#)
- Workplace over time. [Go](#)
- Total effect.

Conclusion

- In this paper, I analyse how the introduction of a job **amenity** that **increases absenteeism** in the workplace affects **wages** and **career trajectories**.
- I find **evidence of absenteeism effects** induced by the introduction of extended maternity leave at the firm.
 - These can **harm workers** if **no enforcement mechanism** is placed
 - Worker: low maternity leave uptake , excessive investment from the worker.
 - Firm: lower wages and rate of promotions for female workers.
- Policy implications:
 - Coordination, maternity (paternity) leave expansions, gender or group-specific policies, 4-day work week (intensive and extensive margins of competition), alternative work arrangements (external validity).

Thank you!



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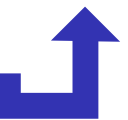
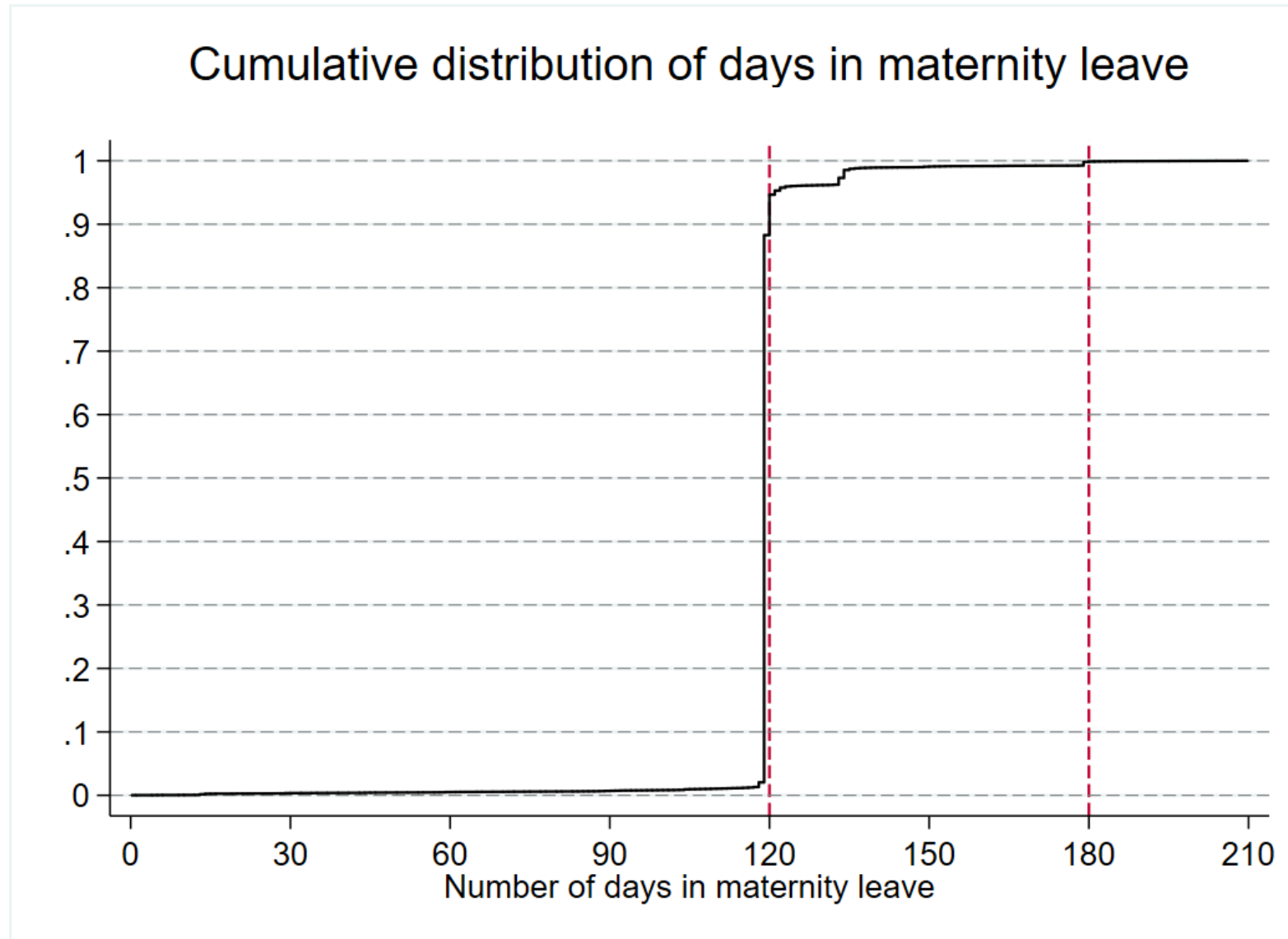
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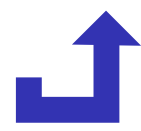
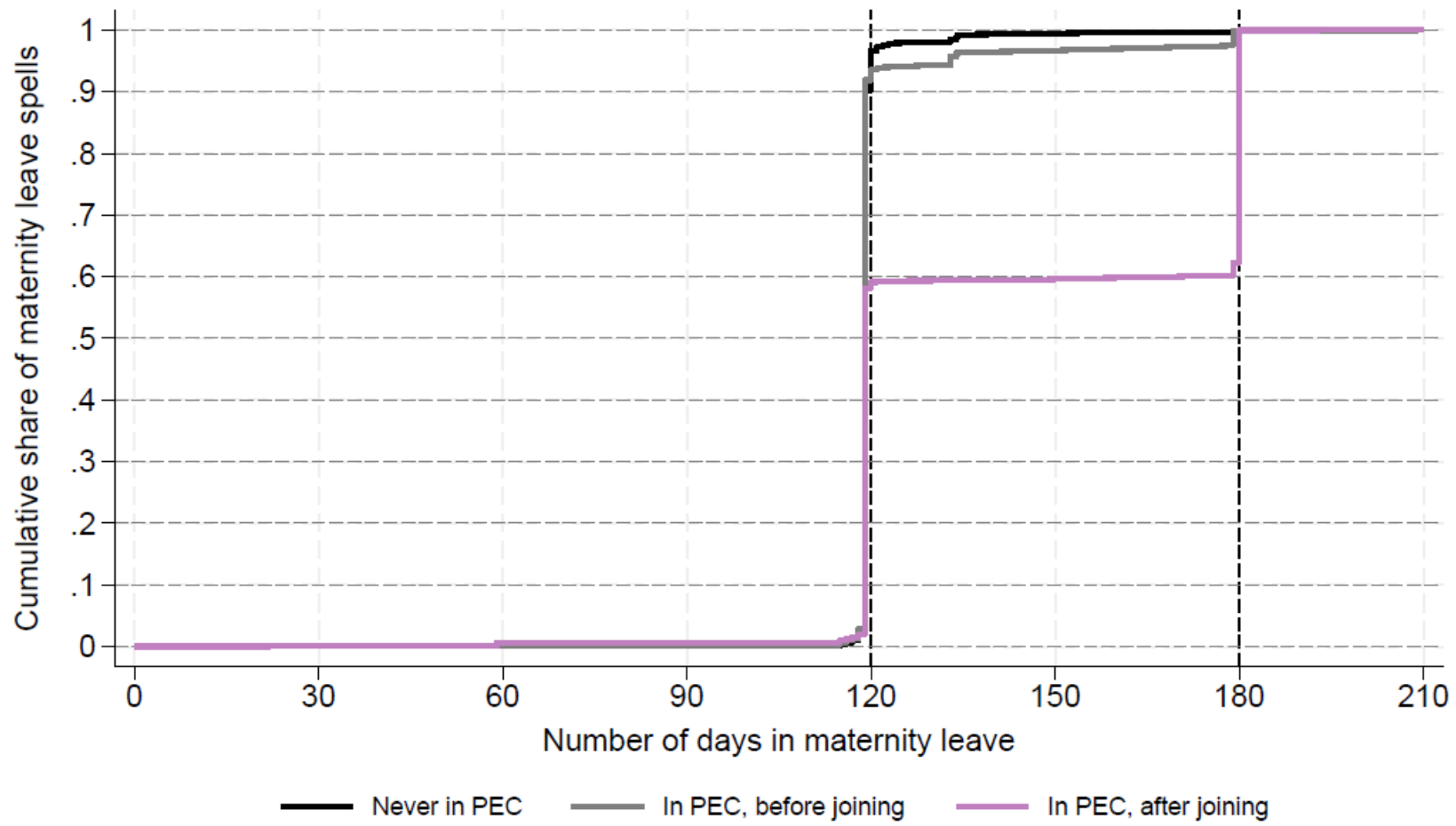


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Appendix

All workers use four months of maternity leave





Descriptives – RAIS 2015

Table 1: Descriptives - RAIS 2015.

Variable	(1)	(2)	(3)	(4)	(5)
Total number of employment spells	69,805,217	48,980,500	33,873,924	30,519,752	10,349,900
Total number of female employment spells	29,719,539	21,227,648	13,091,525	11,643,112	3,636,264
Total number of maternity leave spells	1,031,463	949,462	704,469	641,255	209,535
Total number of firms	2,711,457	2,134,422	628,025	597,863	56,237
Total number of establishments	3,395,763	2,683,396	784,032	712,827	104,855
Average number of employment spells across firms	25.7	17.8	37.4	34.8	124.2
Median number of employment spells across firms	4	3	11	10	23
Average number of employment spells across establishments	20.6	14.1	32.0	30.4	69.7
Median number of employment spells across establishments	4	3	11	11	18
Sample restrictions					
Employed at 01/01/2015		X	X	X	X
Private-sector firms with at least five employment spells			X	X	X
Permanent workers working full-time				X	X
Firms eligible to PEC's fiscal rebate					X

Notes: Universe of firms and workers registered in RAIS 2015 with at least one employment spell on 01/01/2015. A permanent worker is a worker under a contract that is not temporary (i.e., does not have a pre-determined date to end) and a worker is considered to be full-time if she works at least 35 hours per week. A firm is considered to be eligible to PEC's (*Programa Empresa Cidadã*) fiscal rebate if it is under a real-profit tax scheme in 2015. The maternity leave spells recorded in this table include those spells that started in 2014 and finished in 2015, as well as the spells that started in 2015.



Descriptives – PEC adoption

Table 2: Matching between RAIS, tax scheme information, and firms adopting PEC.

	Headquarters only	All establishments
Firms adopting PEC matched to RAIS	16,038	98,316
Firms adopting PEC matched to the tax registry	12,430	64,829
Eligible firms ^a	4,371	54,829
Non-eligible firms ^a	8,059	10,000
Firms that became eligible ^b	547	1,216
Importance in terms of employment spells ^c	0.012	0.041
Importance in terms of maternity leave spells ^c	0.012	0.047

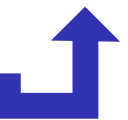
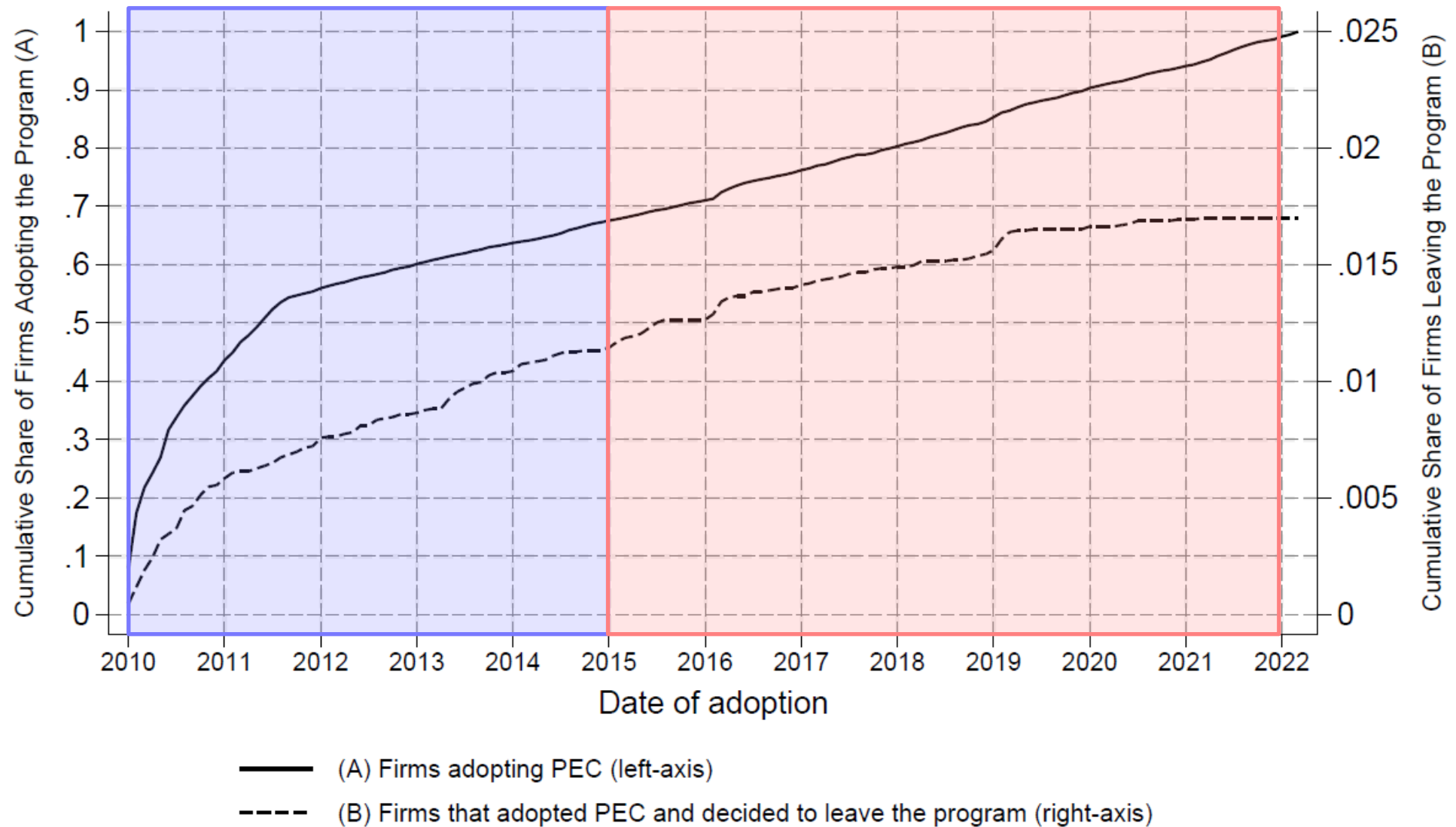
^a Firms under a real-profit tax scheme between 2014 and 2020.

^b Firms that started the 2014-2020 period in any tax scheme other than real profits and moved to real profit taxation at any time.

^c The importance of these establishments is calculated using the average number of employment and maternity leave spells registered in the country between 2010 and 2019.

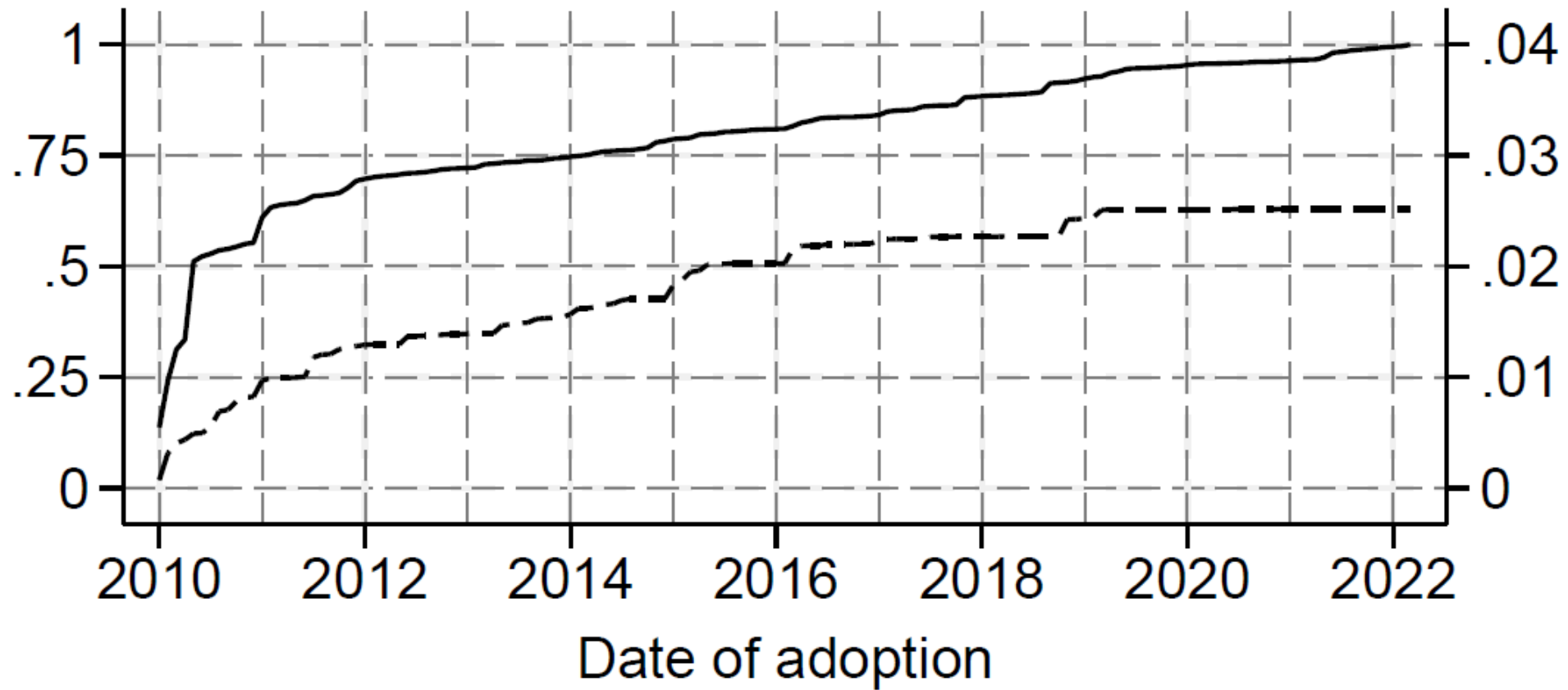


48% of participant firms joined the program within one year after its implementation.



Weighting firms by their importance in terms of ML spells matters.

(c) Weighted - # of ML spells

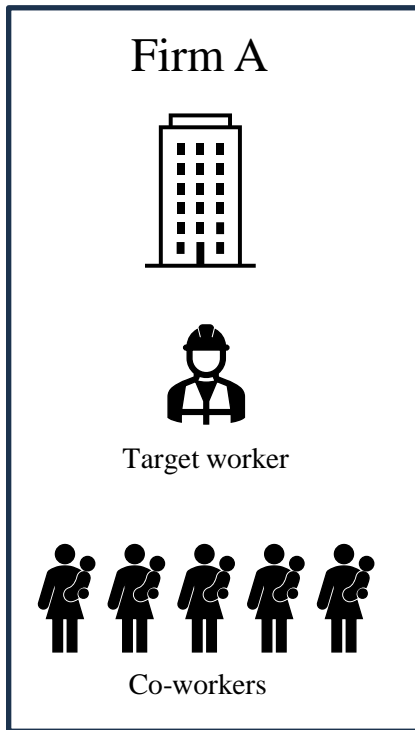


Definition: target workers, target mothers, and co-workers.

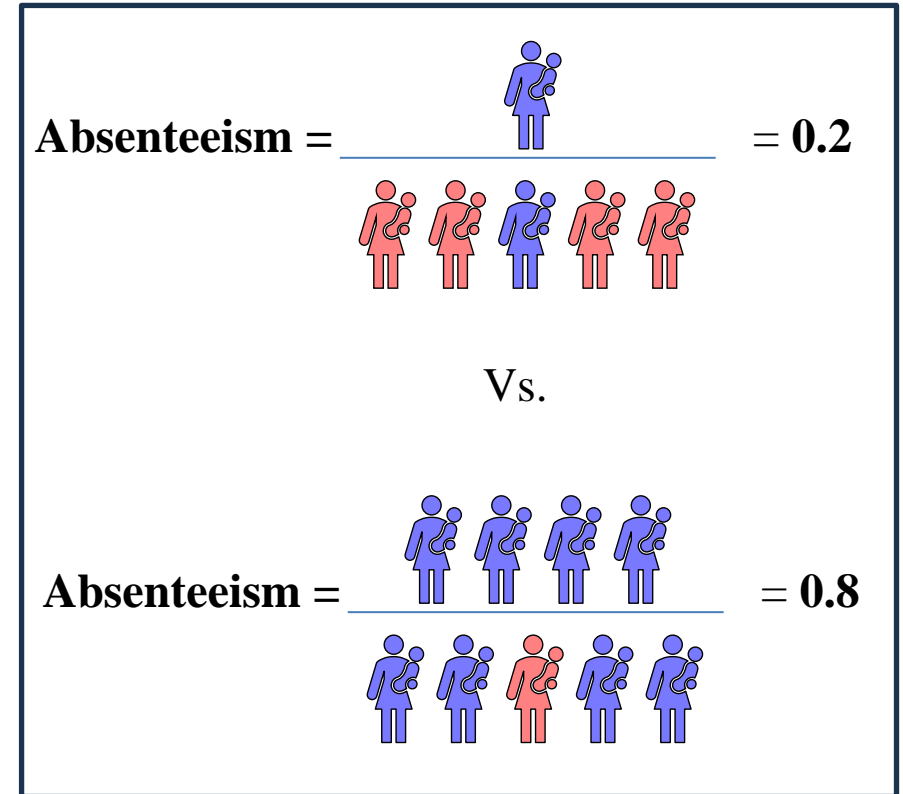
- **Target worker i :** a worker employed by the end of the calendar year of PEC's adoption.
- **Co-workers (\mathbb{C}_i):** all workers (with similar age and education) giving birth in the same 18-month window at firm j .
- **Target mothers ($\mathbb{M}_i \subseteq \mathbb{C}_i$):** any co-worker giving birth in the 18 months around PEC's adoption in each firm j .
- **Absenteeism:** the proportion of workers in \mathbb{M}_i that use extended leave.
 - **Absenteeism effect:** effect of having a co-worker absent for additional two months (six instead of four months at home).



Ideal experiment: random variation in the level of co-worker absenteeism.



- 4 months of ML:
- 6 months of ML:
- 4 months of ML:
- 6 months of ML:



Dynamic specification

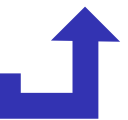
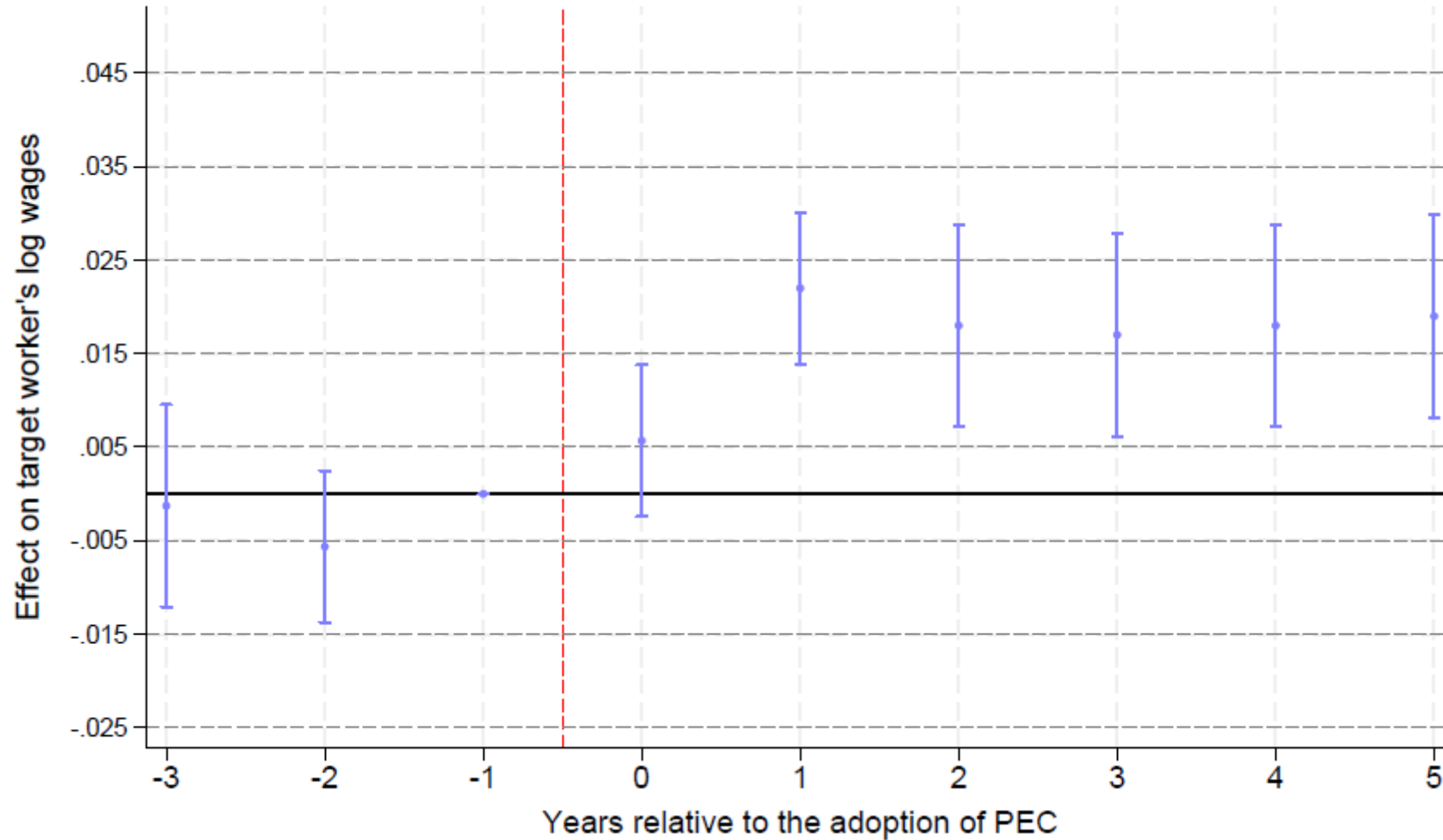
- The equation to be estimated is:

$$y_{it} = \gamma_i + \sum_{\substack{k=-3 \\ k \neq -1}}^7 \beta^k D_{it}^k \times \mathbf{a}_i + \theta_{k(it)} + X'_{it}\Gamma + \varepsilon_{it}$$

- t and k are calendar and event years, respectively.
 - Event time = year of PEC's adoption.
- $D_{it}^k = 1(t = k)$ are event-year indicators.



ITT - Mothers with a higher share of competitors eligible to PEC observe higher wage trajectories up to 4 years post-birth.



OLS effects of co-workers' absenteeism is stronger

Table A6: OLS effects of co-workers' absenteeism on log wages.

	6-digits	5-digits	4-digits	3-digits	2-digits	1-digit	Whole workplace
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Share of absent co-workers (a_i)	2.387*** (0.803)	2.216** (1.056)	2.469*** (0.969)	1.113 (1.712)	0.849 (1.466)	0.0370 (1.479)	0.449 (1.474)
$a_i \times$ High importance	-0.227*** (0.076)	-0.220* (0.123)	-0.229** (0.133)	-0.103 (0.169)	0.084 (0.148)	0.034 (0.128)	- -
Mean of a_i	4.96	5.92	4.76	4.57	4.28	4.73	4.38
Standard deviation of a_i	0.33	0.35	0.38	0.35	0.36	0.36	0.37
Number of observations	253,508	378,942	423,926	587,364	641,872	729,482	1,143,860

Notes: This table reports the OLS coefficients of a regression that has as dependent variable the log of average wages in calendar year t as a function of the share of co-workers absent due to maternity leave in year $t - 1$ (a_i). The variable *High importance* is an indicator for workers whose occupation represents more than 10% of all employment spells in the establishment in year $t - 1$. The sample is restricted to workers with at least one co-worker in year $t - 1$. Each column restricts the definition of co-workers to workers from the same establishment (employed by the 31st of December of $t - 1$) and the same occupational code using the Brazilian Classification of Occupations (CBO). Column (7) considers all workers employed in the establishment by the end of the year as co-workers. All regressions include establishment, year, industry and occupation fixed effects. Standard errors clustered at the establishment level are in parenthesis. All coefficients are multiplied by 100.



No eligibility effects on the target worker's take-up of other leaves

Table A7: Reduced form effects of co-workers' eligibility on workers' leave of absence take-up.

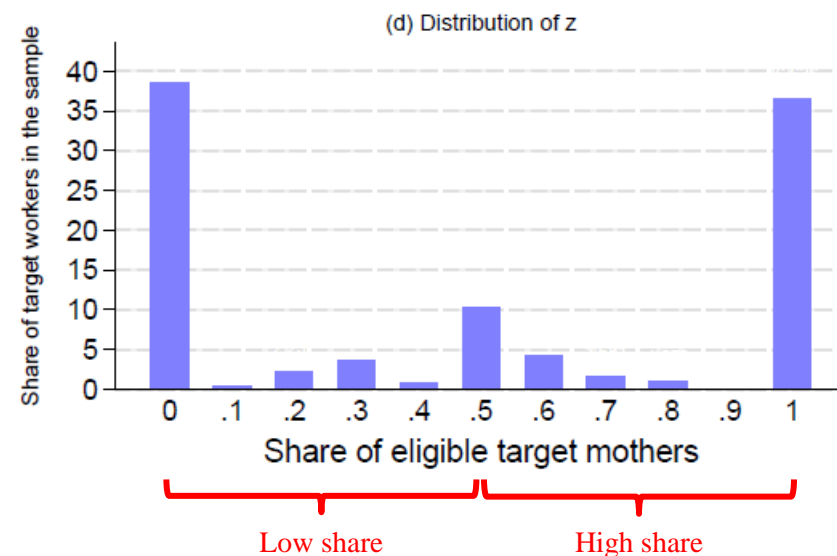
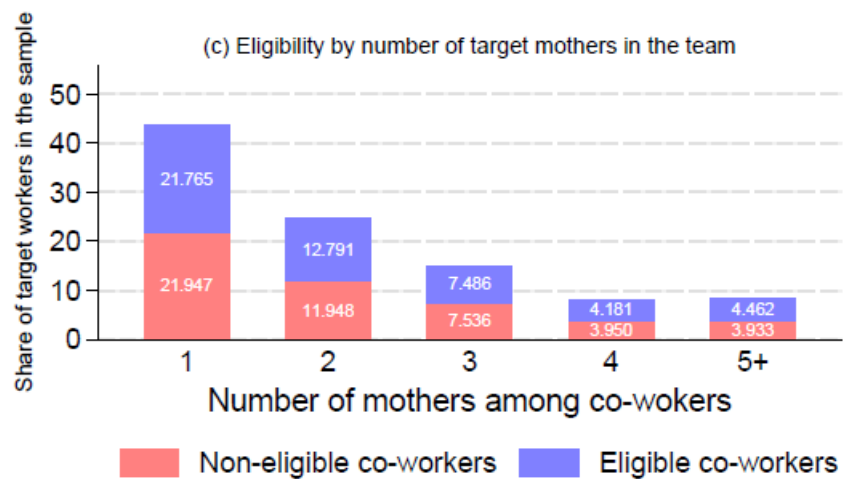
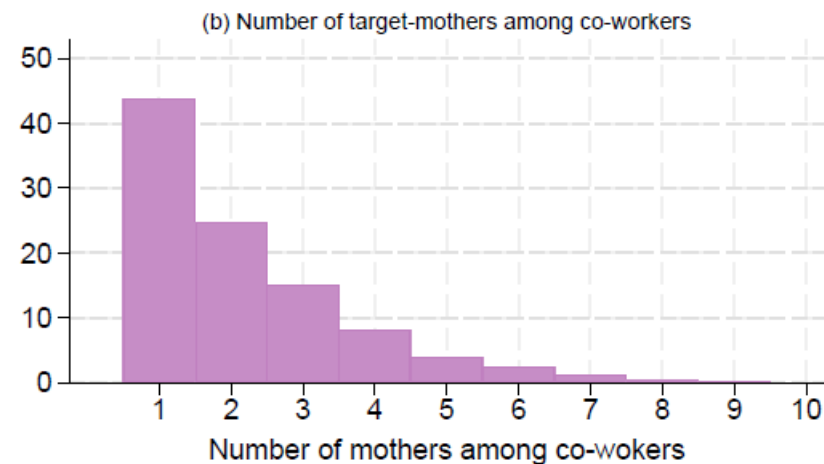
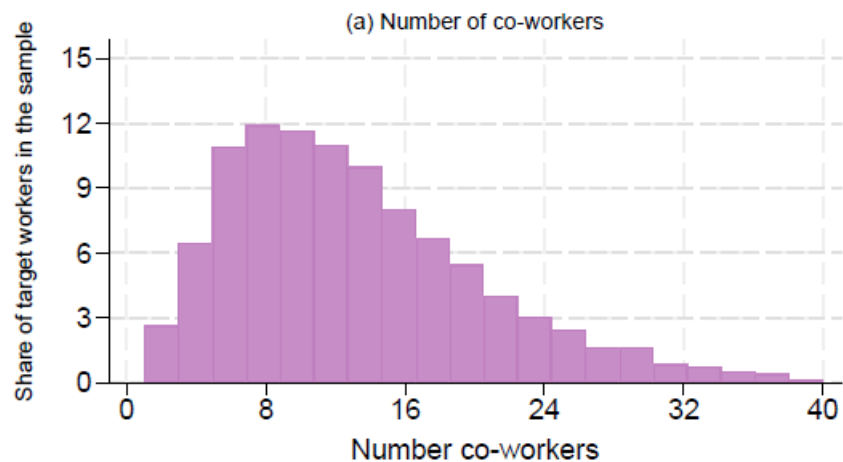
	(1)	(2)	(3)	(4)	(5)
	Any leave	Work-related accident	Work-related illness	Work- unrelated illness	Parental leave
Panel I - Extensive margin: Probability of taking leave of absence^a					
Share of eligible co-workers (z)	2.238 (1.470)	0.024 (0.018)	0.012 (0.009)	0.031 (0.020)	0.143 (0.126)
Mean of dep. variable	42.16	0.10	0.40	1.74	1.35
Number of observations	423,926	423,926	423,926	423,926	423,926
Panel II - Intensive margin: Length of the absence (in days)					
Share of eligible co-workers (z)	5.689 (3.910)	7.700 (6.352)	5.864 (4.791)	7.620 (7.298)	0.275 (0.162)
Mean of dep. variable	77.01	73.12	109.74	47.72	106.54
Number of observations	178,727	423	1,695	7,376	5,723

Notes: This table reports the coefficient of a set of regressions estimating the reduced-form effects of the proportion of leave-eligible co-workers (z) on target workers' extensive and intensive margin of work absenteeism. Panel I measures the extensive margin of leave take-up having as dependent variable an indicator for the take-up of a given type of leave of absence at least once within the five years after the adoption of PEC in the workplace. Panel II estimates the effects on the intensive margin, with the length of the absence as dependent variable (conditional on being absent at least once in the period). Column (1) uses an indicator for being absent for any reason in the period. Column (2) measures the effects of z on the probability of being absent due to a work-related accident. Columns (3) and (4) measure the effects of work-related and unrelated sick leave. Column (5) has as dependent variable an indicator for the take up of parental leave (maternity or paternity leave). Standard-errors are clustered at the establishment level and are reported in parentheses.

^a All coefficients in this panel are multiplied by 100 to represent variations in percentage points.



Good variation in the instrument



Groups with low and high share of eligible competitors are similar in observables

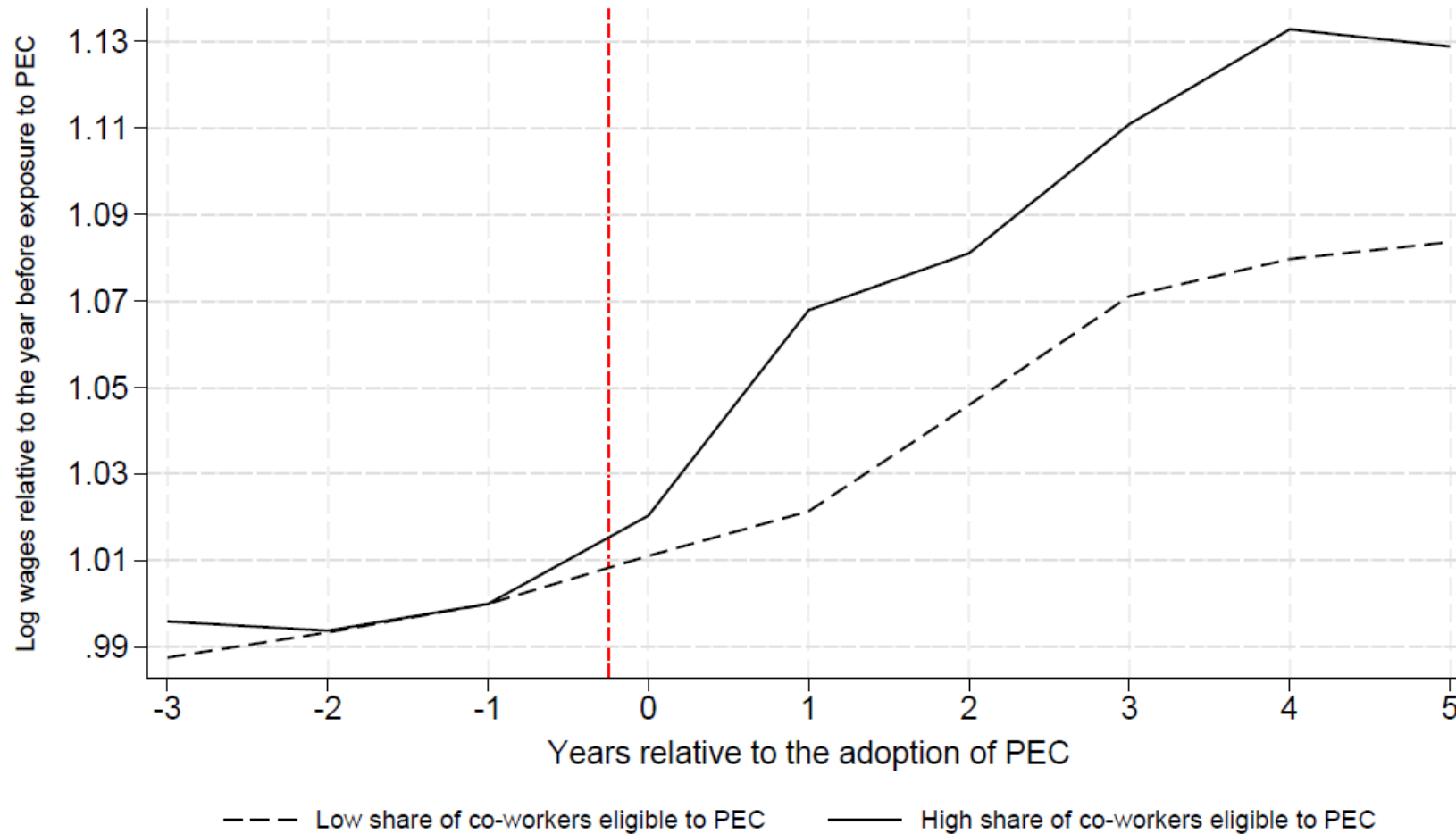
Table 3: Descriptives for target worker's observables in the year before birth.

	By share of co-workers among target mothers who are eligible to extended maternity leave						Difference ^c
	Whole sample		Low-share ($z \leq 0.50$)		High-share ($z > 0.50$)		
	Mean	SD	Mean	SD	Mean	SD	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
<i>Target worker</i>							
Year of admission	2,004.27	7.89	2,004.27	7.91	2,004.26	7.88	0.013
Tenure at PEC's adoption	6.68	7.54	6.67	7.55	6.68	7.52	-0.012
Age at adoption	31.06	9.97	31.07	9.97	31.06	9.96	0.009
Female worker	0.45	0.50	0.45	0.50	0.45	0.50	0.001
College educated	0.45	0.50	0.45	0.50	0.45	0.50	0.001
Annual wage (in 000's of BRL) ^a	38.79	39.97	38.77	39.98	38.81	39.97	-0.040
Mean (median) number of co-workers	11.77 (10)	12.39	11.69 (10)	12.19	11.84 (10)	12.59	-0.153
Share of co-workers eligible to extended leave ^b	0.49	0.45	0.26	0.47	0.72	0.36	-0.465***
Share of co-workers using extended leave ^b	0.24	0.25	0.11	0.18	0.37	0.37	-0.264***
Number of observations	423,926		215,780		211,146		
<i>Target worker's workplace</i>							
Average firm's earnings (in 000's of BRL) ^a	38.31	25.29	37.98	24.62	38.67	25.99	-0.691
Firm size	115.93	484.55	110.69	425.27	121.61	541.68	-10.925
Service sector	0.81	0.39	0.81	0.39	0.81	0.39	-0.004
Share of female workers	0.47	0.20	0.46	0.20	0.47	0.20	-0.002
Share of college-educated workers	0.45	0.32	0.44	0.32	0.46	0.32	-0.014*
Number of observations	7,028		3,660		3,368		



Wage trajectories diverge for target mothers facing low and high absenteeism.

Figure 3: Wage trajectories and co-workers' eligibility to extended maternity leave.

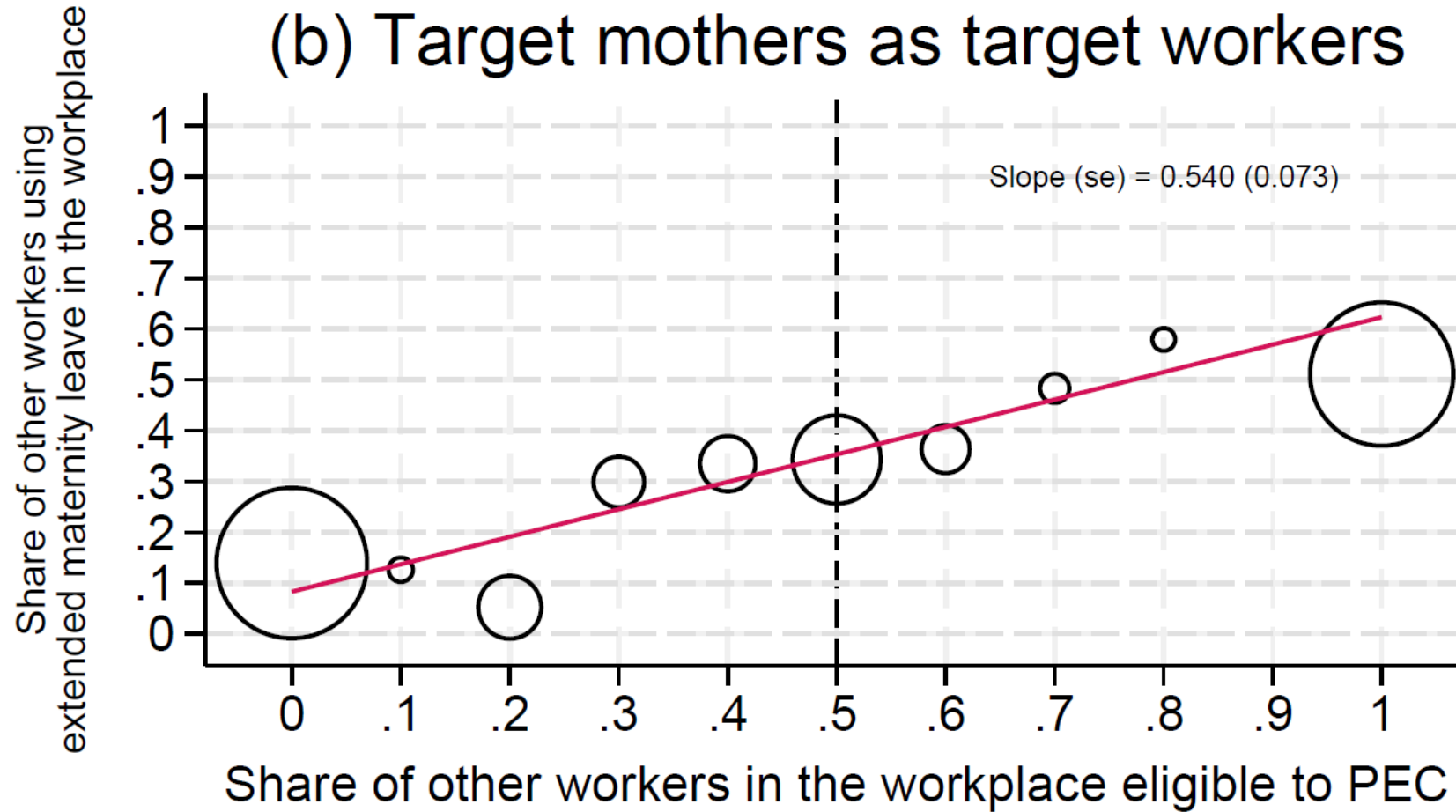


Result 1: The eligibility of co-workers predicts their own take-up.

(a) All target workers - Relevance

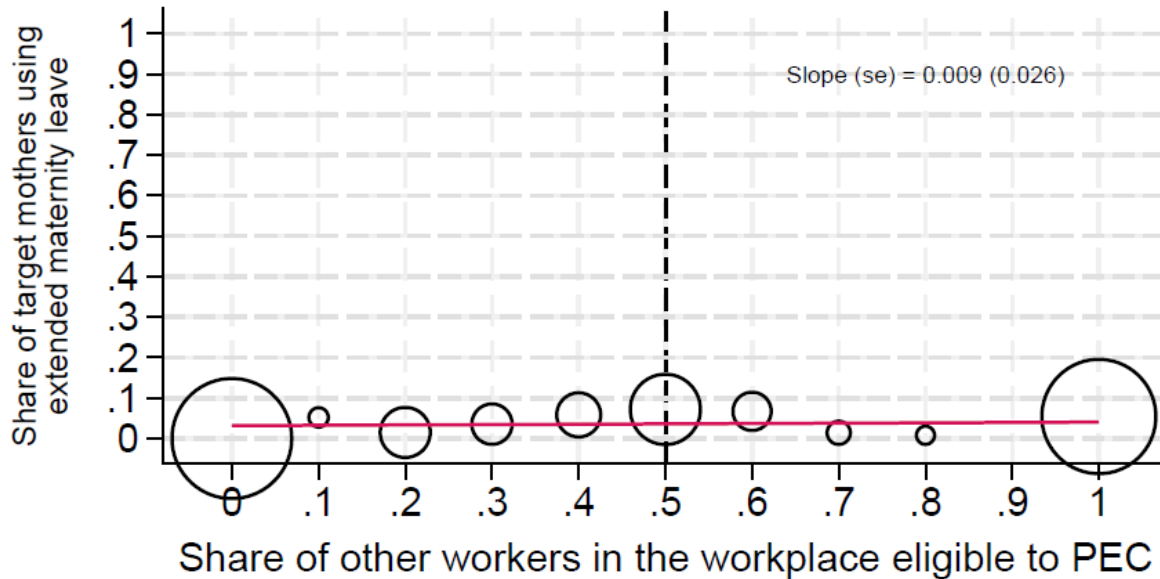


Result 2: The eligibility of other target mothers predicts their take-up.



Result 3: The eligibility of target mothers does not predict the take-up of a given target mother itself.

(c) Non-eligible target mothers



(d) Eligible target mothers



Robustness

Table 5: Robustness on the effects of co-workers' eligibility on target workers' log wages.

	(1)	(2)	(3)	(4)	(5)	(6)
Post \times Share of eligible co-workers (z)	0.016*** (0.007)	0.014*** (0.005)	0.015*** (0.005)	0.011** (0.005)	0.010* (0.005)	0.019** (0.009)
Event-year by year of adoption FE	X	X	X	X	X	X
Individual Covariates	X	X	X	X	X	X
Event-year by demographic group FE		X	X	X	X	X
Linear trend on month and year of adoption			X	X	X	X
Linear trend by number of co-workers				X		
Linear trend by number of mothers among co-workers					X	
Dropping births four months before adoption						X
Number of observations	3,815,334	3,815,334	3,815,334	3,815,334	3,815,334	2,260,784

Notes: This table reports equation's 3 estimates based on a panel of target workers observed three years before and five years after the year PEC was implemented in their firms. The variable z measures the share of co-workers eligible for extended maternity leave. Column (2) includes a linear trend of demographic group (defined as cells of age at birth quartiles and an indicator for having a college education) by event year. Column (3) allows for differential trends on month and year of PEC's adoption at the firm. Columns (4) and (5) include differential linear trends by number of co-workers (1-4, 5-9, 10-24, and 25+ co-workers) and number of mothers among co-workers (1, 2, 3, 4, and 5+), respectively. Column (6) drop from the set of co-workers any mother who was already on maternity leave when PEC was implemented in her firm. Standard errors are clustered at the establishment level.



Placebo date of adoption

Table 6: Effects of co-workers' eligibility on target workers' log wages - Placebo adoption.

	(1)	(2)	(3)	(4)	(5)	(6)
	Placebo adoption one year before			Placebo adoption two years before		
Post \times Share of eligible co-workers (z)	0.048 (0.006)	0.047 (0.005)	0.050 (0.004)	0.024 (0.009)	0.016 (0.007)	0.024 (0.006)
Event-year by year of birth FE		X	X		X	X
Individual covariates			X			X
Number of observations		3,748,932			3,712,383	

Notes: This table reports the ITT effects from equation 3 using a placebo adoption of PEC. The variable z measures the share of co-workers eligible for extended maternity leave. The variable $Post$ is an indicator to denote observations that happen after the adoption of the program. The placebo exercise is defined as if the introduction of PEC in each firm in the sample has happened one year (columns 1-3) or two (columns 4-5) years before the actual date of adoption. Like in Table 4, the sample is based on a panel composed of target workers observed three years before and five years after the placebo date of the program's introduction in the firm. The variable z measures the share of co-workers eligible for extended maternity leave. All have standard errors clustered at the firm level.



Heterogeneity

- Effects of absenteeism is unlikely to be present in all workplaces.

Table 7: Effects of co-workers' eligibility on target workers' log wages - Heterogeneity by different workplace settings.

	<u>Expected prize</u>		<u>Firm size growth</u>		<u>Availability of high-skill jobs</u>	
	Low dispersion	High dispersion	Low growth	High growth	Low availability	High availability
	(1)	(2)	(3)	(4)	(5)	(6)
Post × Share of eligible co-workers (z)	0.010 (0.008)	0.021*** (0.008)	0.032*** (0.009)	0.010 (0.010)	0.052*** (0.008)	0.012 (0.010)
Number of observations	1,910,618	1,904,716	1,934,052	1,881,282	1,917,695	1,897,639

Notes: This table reports equation's 3 estimates based on a panel of target workers observed three years before and five years after the year PEC was implemented in their firms. The variable z measures the share of co-workers eligible for extended maternity leave. The variable $Post$ is an indicator to denote observations that happen after the adoption of the program. Columns (1)-(2) split the sample between target workers who were in firms with wage growth dispersion (measured as the standard deviation of the within-establishment wage growth distribution of all female workers in the workplace between two years prior and the year of PEC's adoption) above and below the median, respectively. Columns (3)-(4) do the same but split the sample using the growth size of their establishment within the same period. Finally, Columns (5)-(6) split the sample between target workers in firms with above and below the median share of high-skill jobs in their establishments in the year before birth, respectively. All regressions include individual fixed effects and event-year by year of birth fixed effects. Standard errors are clustered at the establishment level.



Table 8: Effects of co-workers' eligibility on target workers' log wages - Heterogeneity by gender and age group.

	(1)	(2)	(3)	(4)	(5)
	<u>Whole sample</u>	<u>Female workers</u>		<u>Male workers</u>	
		All age groups	40+ years old	All age groups	40+ years old
Post × Share of eligible co-workers (z)	0.016*** (0.007)	0.003 (0.014)	0.001 (0.020)	0.028** (0.012)	0.021 (0.019)
Number of observations	3,815,334	1,376,914	344,228	1,633,470	460,722

Notes: This table reports equation's 3 estimates based on a panel of target workers observed three years before and five years after the year PEC was implemented in their firms. The variable z measures the share of co-workers eligible for extended maternity leave. The variable $Post$ is an indicator to denote observations that happen after the adoption of the program. Column (1) shows the main specification from Table 4. Columns (2)-(3) restricts the sample to female workers from all age groups and those at least 40 years old in the year of PEC's adoption in the firm. Columns (4)-(5) split the sample similarly for male workers. All regressions include individual and event-year by year of birth fixed effects. Standard errors are clustered at the firm level.



Separations, layoffs, and promotions

- y_i is an indicator for a target mother having a:

Table 9: Effects of absenteeism on target workers' labour market outcomes.

	(1)	(2)	(3)	(4)	(5)	(6)
	<u>Prob. of separation</u>		<u>Prob. of layoff</u>		<u>Prob. of promotion</u>	
Share of eligible co-workers (z)	-2.498*** (0.678)	-2.469*** (0.577)	-1.587* (0.845)	-1.564* (0.822)	2.876*** (0.901)	2.912*** (0.837)
$z \times Female$	0.597 (0.709)	0.622 (0.678)	1.175 (1.025)	1.720* (0.941)	-1.892* (1.052)	-1.828* (0.958)
Event-year by year of birth FE	X	X	X	X	X	X
Individual covariates		X		X		X
Number of observations	423,926					

Notes: This table reports the coefficient of for a cross-section of target workers. Columns (1)-(2) have as dependent variable an indicator for workers who separated from their original firm anytime within five years after the year of PEC's adoption (column (2) includes individual covariates). Columns (3)-(4) replicate the same specifications but change the outcome variable for an indicator for workers who left their jobs due to the employer's initiative (layoffs) in the same period. Columns (5)-(6) have as dependent variable an indicator for workers who were promoted at least once in the same period. Standard errors clustered at the firm level. The variable z measures the share of co-workers eligible for PEC, and *Female* is an indicator to denote female target workers.



Exposure to (female) absenteeism

- DiD to estimate the effects of being exposed to female absenteeism:

$$y_{it}^M = \alpha + \rho_1 T_i + \rho_2 Post_t^M + \rho_3 (T \times Post^M)_{it} + \varepsilon_{it}$$

- T_i is an indicator for target workers exposed to PEC.
 - Comparison group: workers with similar observables (two years before PEC's adoption) who were never exposed to PEC (similar firms that never adopted the program).
- $Post_t^M$ is an indicator to denote observations $M = 2$ years after PEC's introduction.
 - The baseline period is defined in the year prior the adoption.
- ρ_3 is the effect of exposure to female absenteeism for workers exposed to PEC.
 - Identification under parallel trends and no anticipation.



Table 10: Descriptive statistics for treated workers and correspondent matched comparison groups.

Variable	Group	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Panel I - Worker's characteristics								
Female	Treated	0.45	0.46	0.46	0.47	0.47	0.48	0.49
	Matched comparison group	-	0.46	0.46	0.47	0.47	0.48	0.49
Age	Treated	31.81	31.43	31.58	31.30	31.18	31.06	31.34
	Matched comparison group	-	31.46	31.61	31.20	31.16	31.00	31.26
Monthly earnings	Treated	3024.00	3166.23	3037.49	3171.76	3127.40	3030.00	3187.27
	Matched comparison group	-	3048.23	3104.49	3079.76	3104.40	2937.00	3375.27
Hours worked per week	Treated	40.37	40.21	40.63	40.55	40.15	40.88	40.87
	Matched comparison group	-	40.27	40.64	40.63	40.08	40.86	40.93
Tenure in years	Treated	6.68	6.71	6.70	6.72	6.72	6.71	6.71
	Matched comparison group	-	6.71	6.70	6.72	6.72	6.71	6.71
College	Treated	0.45	0.49	0.46	0.49	0.48	0.46	0.47
	Matched comparison group	-	0.48	0.47	0.50	0.48	0.46	0.47
Number of co-workers	Treated	19.59	19.62	19.62	19.62	19.61	19.60	19.61
	Matched comparison group	-	19.94	19.89	19.15	19.78	19.89	18.67
Share of female co-workers	Treated	0.46	0.48	0.47	0.48	0.46	0.47	0.50
	Matched comparison group	-	0.48	0.47	0.47	0.45	0.48	0.50
Number of observations		423,926	364,576	195,005	252,659	178,472	83,937	38,023
Panel II - Firm's characteristics								
Size	Treated	115.93	115.62	115.90	116.24	115.40	116.69	115.94
	Matched comparison group	-	115.68	116.43	116.01	114.54	116.04	115.43
Share of female workers	Treated	0.47	0.47	0.47	0.47	0.48	0.46	0.47
	Matched comparison group	-	0.48	0.46	0.47	0.48	0.46	0.46
Share of college-educated workers	Treated	0.45	0.46	0.44	0.45	0.46	0.45	0.45
	Matched comparison group	-	0.46	0.44	0.45	0.45	0.46	0.45
Number of observations		7,028	6,198	3,327	4,287	3,072	1,423	653



Table 11: OLS effects of exposure to PEC for different comparison groups.

	(1)	(2)	(3)	(4)	(5)	(6)
Panel I - Log wages						
Post × Treat	0.0135** (0.0058)	0.0228* (0.012)	0.0168 (0.018)	0.0194 (0.036)	0.0252 (0.0158)	0.0226 (0.436)
Panel II - Probability of promotion						
Post × Treat	0.8448** (0.3694)	1.1813 (0.722)	0.8837 (1.102)	1.0957 (2.2338)	1.0535 (7.789)	0.7827 (12.749)
Sample restrictions:						
Never treated	X					
Not-yet-treated		X				
Same firm, different workplace			X	X		
Same workplace					X	X

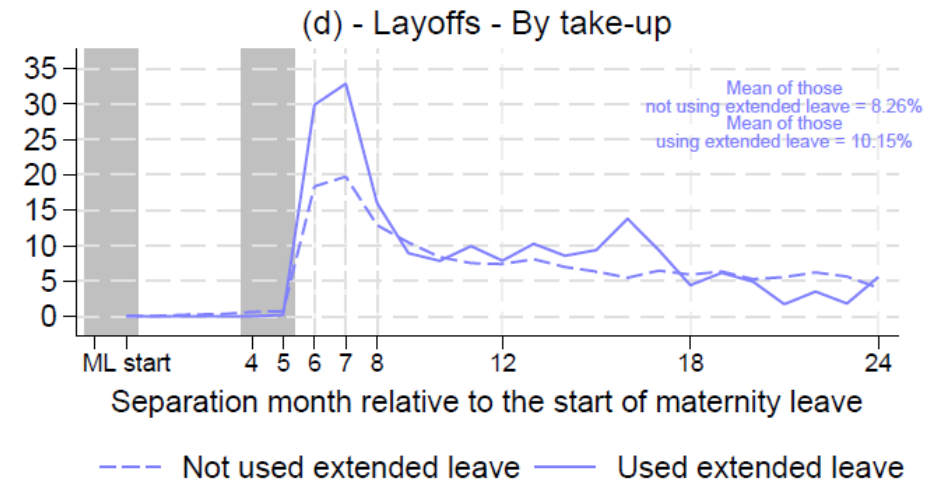
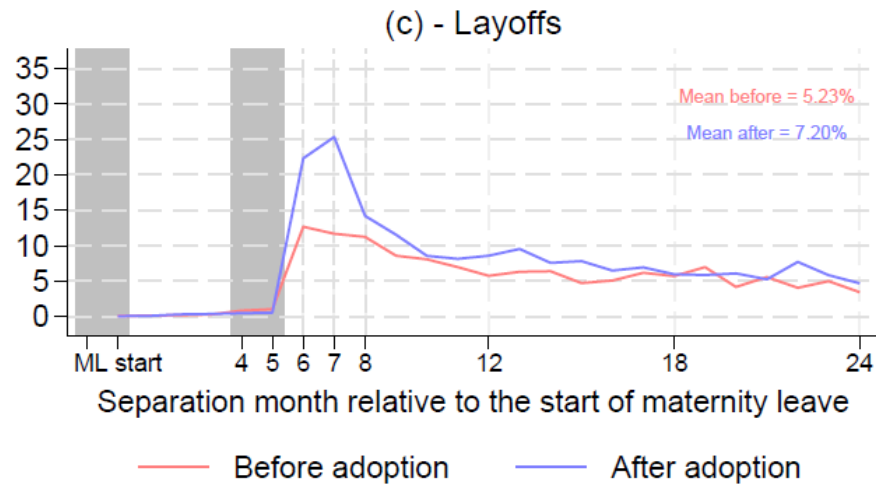
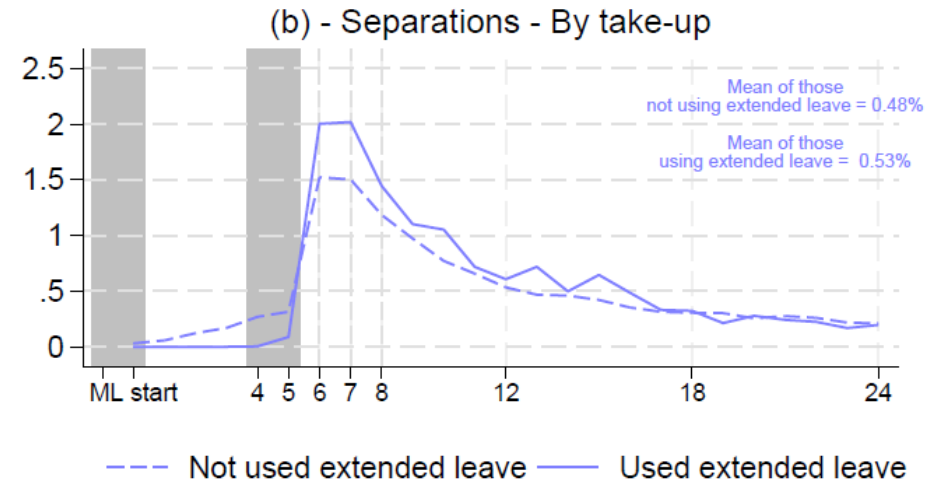
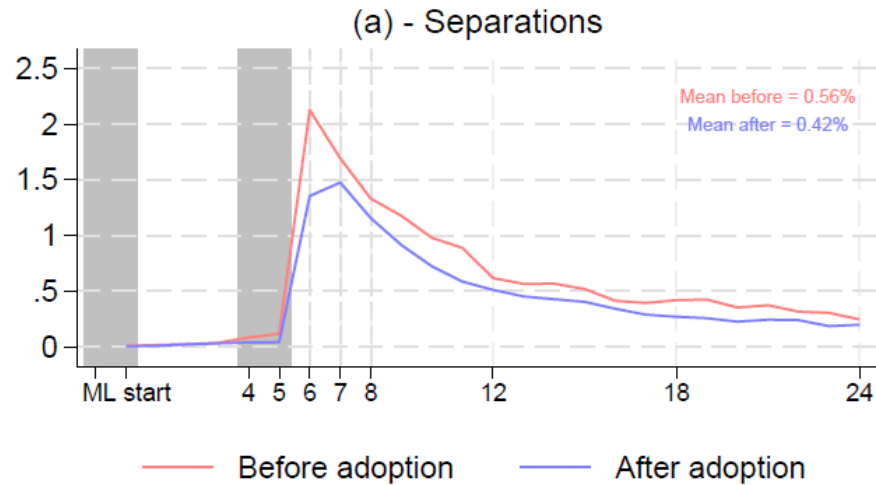
Six-digit occupation	X	X		X		

Four-digit occupation			X			

No female co-workers			X	X		
No co-workers on maternity leave					X	
No co-workers on extended maternity leave						X
Number of observations	729,152	390,010	505,318	356,944	167,874	76,046

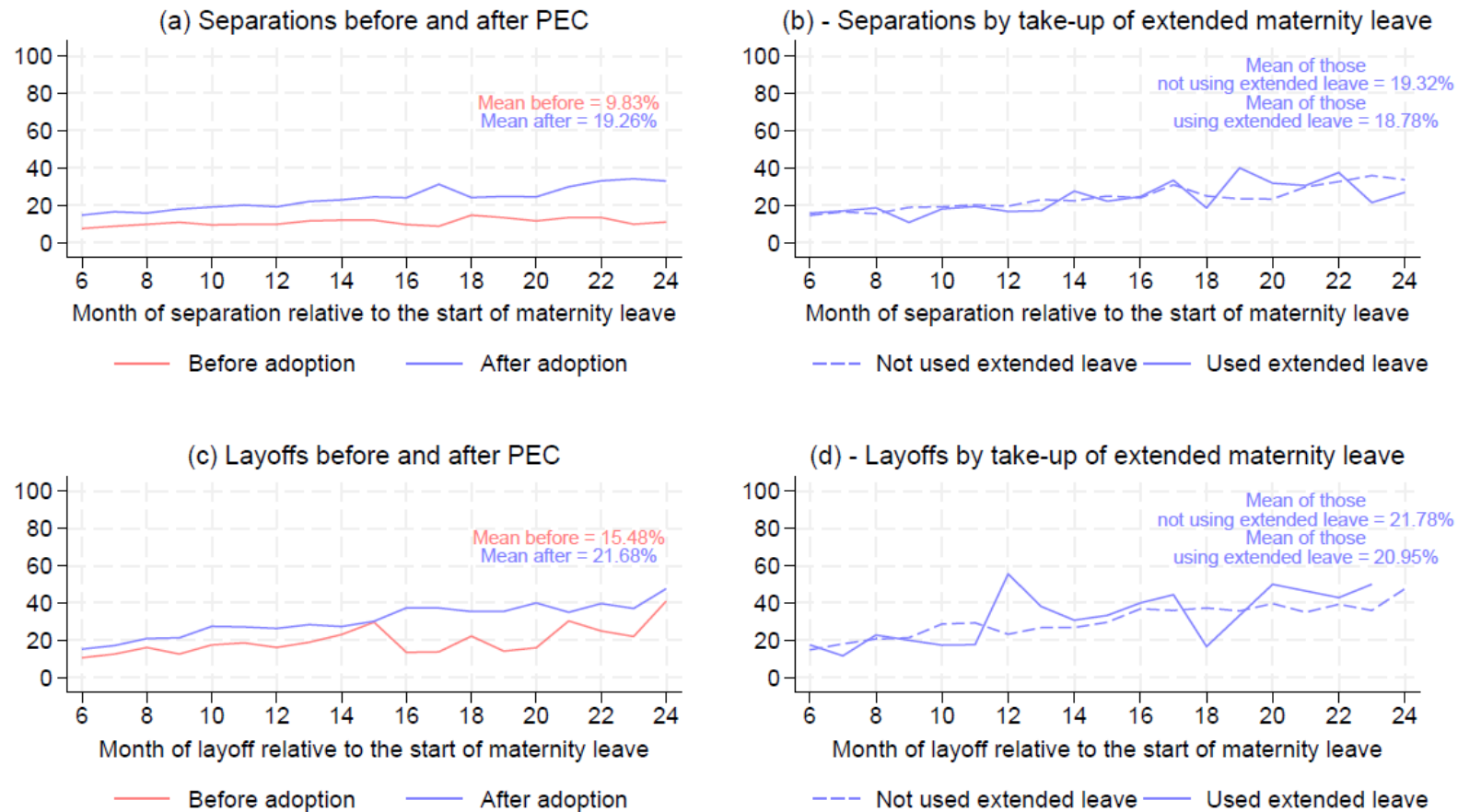


Exposure and take-up are associated with higher probabilities of separation.



Exposure is also associated with a higher probability of reemployment

Figure A13: Probability of reemployment within six months after separation.



Spillover effects

- Empirical specification (following Hesselius et al., 2009):

$$ML_i = \alpha + \beta_1 E_i + \beta_2 z_i + \varepsilon_i$$

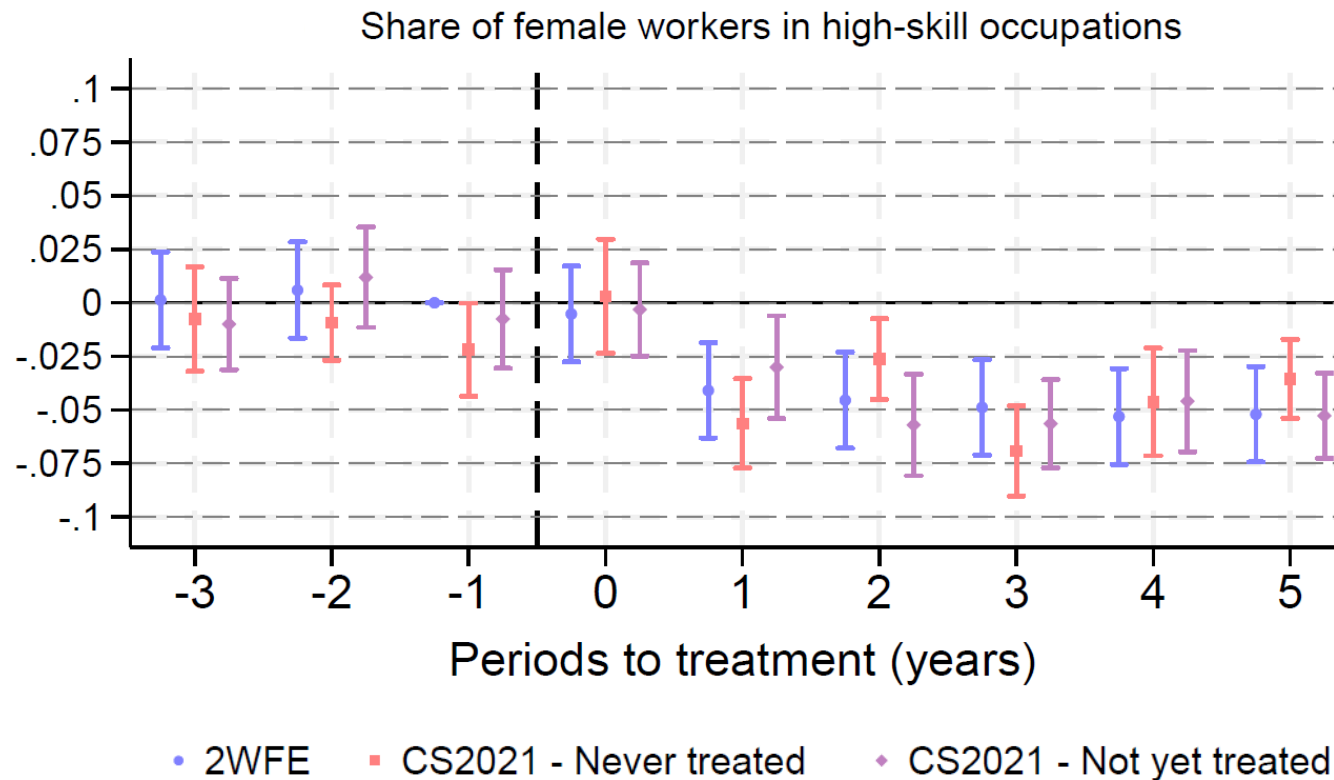
Table A6: Direct and indirect effects of extended maternity leave at the workplace on maternity leave take-up.

	(1)	(2)
Panel I - Intensive margin: Number of days on leave		
E	7.735*** (1.308)	7.735*** (1.307)
z		1.540 (1.028)
Panel II - Extensive margin: Indicator for using 6 months of leave		
E	0.033 (0.008)	0.033*** (0.008)
z		0.013 (0.009)
Number of observations		8,799



Significant decrease in the share of female workers in top occupations.

$$y_{ft} = \alpha_f + \alpha_t + \mu \times treat_f + \sum_{\substack{k=-3 \\ k \neq -1}}^5 \lambda_k \times D_{ft}^k \delta_k (treat_f \times D_{ft}^k) + \varepsilon_{ft}$$



Definition of skill



Mechanism: Promotions

- Promotions are defined as:
 - (a) Climbing the firm wage ladder: a worker in the top decile of the firm wage growth distribution.
 - (b) Climbing the labour market wage ladder: a worker in the top decile of the wage growth distribution of his/her market.
 - A market is defined using four dimensions: sex, tenure group (3 years), region, industry (two digits), and occupation (four digits)



Occupation

- Brazilian Classification of Occupations (CBO2002): 6-digit code that identifies labour market occupations in Brazil.

123205: HR Director

142205: HR Manager

252405: HR Analyst

203005: Environmental Biology Researcher

203010: Animal Biology Researcher

213110: Physicist (Acoustics)

213115: Physicist (Atomic)

213120: Physicist (Cosmology)

213130: Physicist (Fluids)

213145: Physicist (Materials)

203205: Civil Engineering Researcher

203215: Electric Engineering Researcher

203220: Mechanic Engineering Researcher

203225: Materials Engineering Researcher

203230: Chemistry Engineering Researcher

251205: Economist

251210: Agricultural Economist

251215: Finance Economist

251220: Industrial Economist

251225: Public Economist

251230: Environmental Economist

251235: Urban Economist



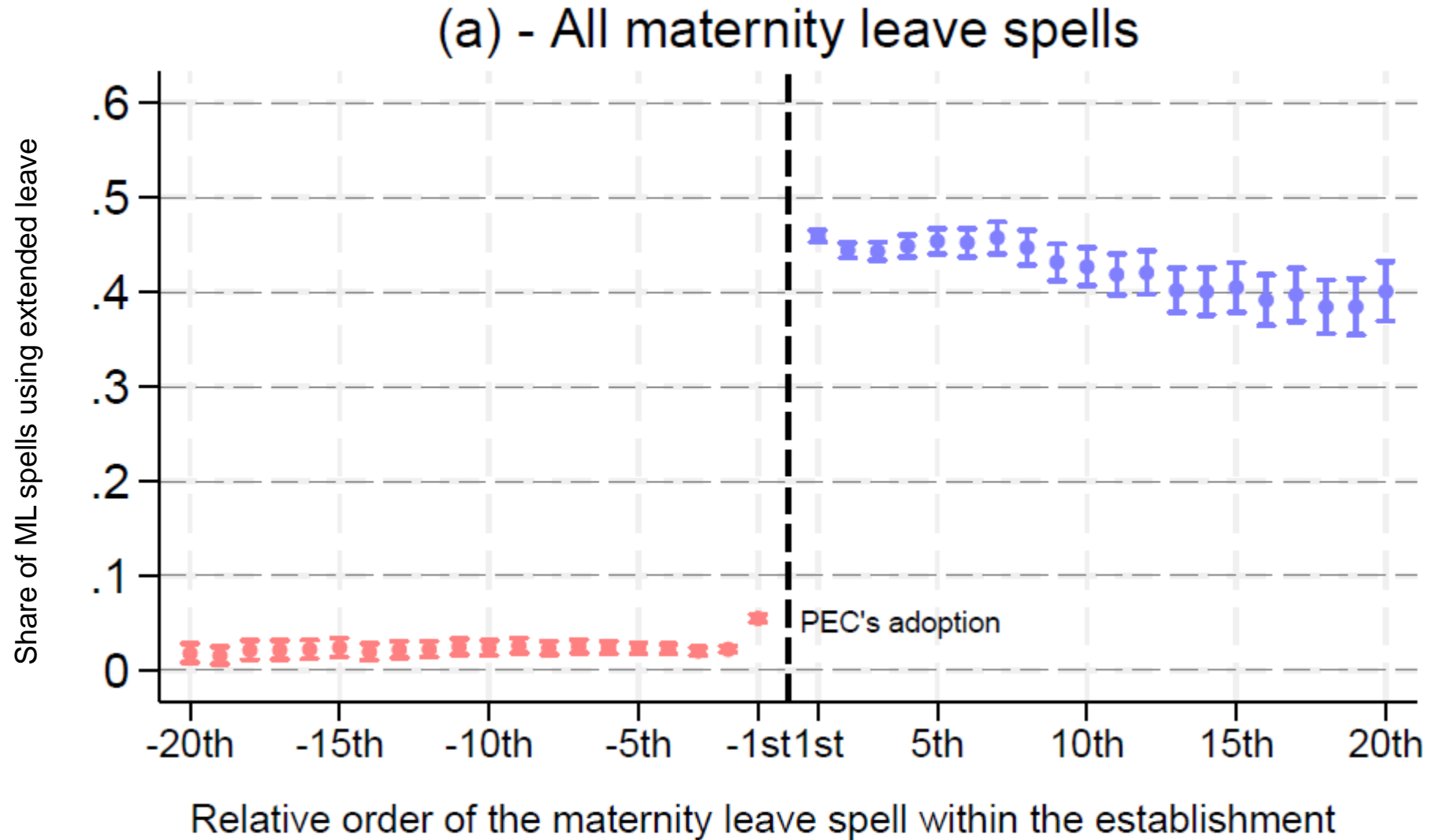
Table A6: OLS effects of co-workers' absenteeism on log wages.

	6-digits	5-digits	4-digits	3-digits	2-digits	1-digit	Whole workplace
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Share of absent co-workers (a_i)	2.387*** (0.803)	2.216** (1.056)	2.469*** (0.969)	1.113 (1.712)	0.849 (1.466)	0.0370 (1.479)	0.449 (1.474)
$a_i \times$ High importance	-0.227*** (0.076)	-0.220* (0.123)	-0.229** (0.133)	-0.103 (0.169)	0.084 (0.148)	0.034 (0.128)	- -
Mean of a_i	4.96	5.92	4.76	4.57	4.28	4.73	4.38
Standard deviation of a_i	0.33	0.35	0.38	0.35	0.36	0.36	0.37
Number of observations	253,508	378,942	423,926	587,364	641,872	729,482	1,143,860

Notes: This table reports the OLS coefficients of a regression that has as dependent variable the log of average wages in calendar year t as a function of the share of co-workers absent due to maternity leave in year $t - 1$ (a_i). The variable *High importance* is an indicator for workers whose occupation represents more than 10% of all employment spells in the establishment in year $t - 1$. The sample is restricted to workers with at least one co-worker in year $t - 1$. Each column restricts the definition of co-workers to workers from the same establishment (employed by the 31st of December of $t - 1$) and the same occupational code using the Brazilian Classification of Occupations (CBO). Column (7) considers all workers employed in the establishment by the end of the year as co-workers. All regressions include establishment, year, industry and occupation fixed effects. Standard errors clustered at the establishment level are in parenthesis. All coefficients are multiplied by 100.



The policy has bite and increases absenteeism at the workplace.



Definition of skill

- Colonelly et al. (2020) group the Brazilian Classification of Occupations (CBO2002) into 4 categories:
 - High-skill – Managers+.
 - Medium high-skill – associates and technicians.
 - Medium low-skill – white collar.
 - Low skill – blue collar.
- Similar results using the procedure proposed in Cortés and Pan (2020).
 - Here I rank each occupation in the dataset by their average wage in each region-year cell. I define high-skill occupations as those in the top quartile of this distribution

